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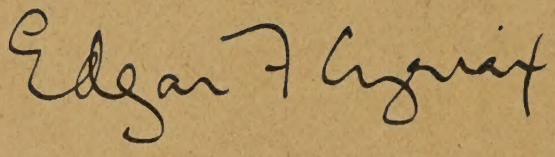

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HANDBOOK OF MASSAGE.

KLEEN.

HANDBOOK

OF

MASSAGE

BY

EMIL KLEEN, M.D., PH.D.,

PRACTICING PHYSICIAN IN CARLSBAD, BOHEMIA.

AUTHORIZED TRANSLATION FROM THE SWEDISH.

BY

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INTRODUCTION TO THE AMERICAN EDITION.

I read with care much of Dr. Kleen's book in its German dress, and was glad to find so calmly scientific a statement of the uses and effects of massage.

We have long needed a study of this therapeutic aid from a higher point of view than that of the mere masseur, who is too apt to see in massage an agent applicable to all diseases. Those who have wearily retired from the mystery, or excessive detail or too positive conclusions with which the professional masseur, when writing of massage, surrounds and complicates a simple matter, will, I am sure, be pleased to find it considered without excess and with clear good sense.

I cordially recommend Dr. Hartwell's translation of this interesting treatise to such as desire to learn what is at present known of massage, its uses, methods, and effects.

I know of no other book on this subject which is so good as this.

S. Weir Mitchell.

TRANSLATOR'S PREFACE TO THE GERMAN EDITION.

Kleen's Handbook of Massage possesses so many points of superiority to the by no means small number of handbooks and treatises on the same subject, that it seems a thankworthy undertaking to make it accessible, by means of a translation into German, to a larger circle of readers. Kleen's clear, scientific manner of statement, and his independent, critical sifting of the material, are especially praiseworthy. Kleen's book, therefore, seems to me to be of value to the practicing physician, in that it is free from all specialistic narrowness and enthusiasm for massage; does not run into extravagance in setting up indications for it, or into parsimony in showing its contraindications; and always assigns massage its place among the other adjuvant measures of therapy.

GUSTAV SCHÜTZ.

Berlin, July, 1890.

AUTHOR'S PREFACE TO THE GERMAN EDITION.

When I resolved, some four years ago, to write a handbook on massage, and prepared the first part of this work in the language I am most familiar with,* the lack which I hoped to make good, in some measure, was much greater than is now the case. Several books upon this subject, particularly by German writers, have appeared very recently. However, since none of them fully covers my views, I have accepted Dr. Schütz's offer to translate my book into German with particular satisfaction.

Properly speaking, my book was intended for students of medicine, with especial regard to Swedish exigencies; and I hoped to give the younger members of my profession a brief summary of the facts regarding a procedure which is rightly coming to occupy a more and more prominent place in modern therapy. It was my further desire to set forth the contraindications of massage as fully as the indications for it; to show their range and scope without exaggeration; and, so far as I could, to combat the oft-expressed inclination to advance massage to the dignity of an exclusive method of treatment. I have, therefore, endeavored to bring it about that my readers should look upon massage as I do myself, viz., as a remedial measure, among many, that is capable of being frequently employed, but which is seldom to be resorted to by itself alone.

Inasmuch as a portion of my circle of readers will consist of persons who have not completed their medical studies; I have

* The publication of this book was much delayed, owing to the pressure of other engagements, till, finally, the first part was published in Stockholm, in November, 1888, and the second part followed in a few weeks; the third part was first issued from the press in April, 1890.

been obliged to admit various topics that are superfluous for fully-fledged physicians.

I have been somewhat in doubt whether I should have the chapter on the Technique of Massage illustrated or not. I have omitted to do so, however, because illustrations in this case give scarcely any more clearness of ideas than the description would, and because one can now obtain, at most centres of medical teaching, a short practical course, such as makes all illustrations superfluous, and is especially desirable in and for itself. Moreover, I am of the opinion that the most potent factor in securing a good technique in massage is to be found in an exact knowledge of its physiological effects.

As I am not a "Massage-Specialist," my own list of cases is rather limited,—the more so as I have seldom made notes in my massage-cases, except when I have worked at this volume, from time to time. When I had no case of my own appropriate for citation, I have used the cases of others, and credited the author cited.

My little work has won far wider recognition than I had hoped for in Sweden, and to some degree already in Germany, as an exposition of massage.

On the other hand, my discussion of Ling, as well as that concerning the Swedish gymnasts, has brought down upon me, besides various expressions of approbation, the condemnation of some of my Swedish countrymen. However, as I cannot learn that I have been guilty of injustice either to Ling or the Swedish gymnasts, I have suffered the passages in question to remain in the German edition (which, as a whole, shows only insignificant changes) as they were in the Swedish.

A great number of friends, both in Germany and Scandinavia —no one named and no one forgotten—have given me accounts of their experiences, for which I am heartily thankful to them.

EMIL KLEEN.

Carlsbad, April, 1890.

TRANSLATOR'S PREFACE TO AMERICAN EDITION.

Although medical lexicographers may be found who are willing to define mechano-therapy as that department of therapeutics which includes massage and medical gymnastics as its most distinctive branches, medical teachers, for the most part, have not deemed it worth their while to expound even the principles of muscular exercise in general, or of massage and medical gymnastics in particular. On account of this neglect of the science of mechano-therapy, and for other reasons that are not far to seek, medical practitioners, as a rule, are indifferent or averse to the art of the masseur and the gymnast. Meanwhile, the tolerably rapid increase of untrained and pretentious laymen as mechano-therapeutists bears emphatic witness to an inexpungable belief on the part of the general public that manipulations and exercise are frequently preferable to the prescriptions of chemical therapeutics; and the result is that wild and absurd theories easily gain credence, though the scientific bases of mechano-therapy are simple, plain, and well established, and that much suffering and weakness remain unrelieved or are protracted and intensified.

Granted that mechano-therapy has been largely and unduly exploited by uninstructed persons and through unprofessional means, and that, in modern times, mechano-therapy never has been and never ought to become more than a minor and subordinate department of medicine, still, the interests of the profession and of the public alike demand that ignorant and mercenary laymen should not be suffered, through default, to figure as its principal sponsors and representatives. The masseur and the gymnast should be trained, guided, and controlled by competent medical teachers and practitioners, as is the case with nurses, and also to some extent with bath-attendants. Such a consummation must remain impossible of realization, at

least in this country, so long as those whose office it is to create and shape medical opinion are too apathetic or too supercilious to weigh and sift the claims of mechano-therapy; to familiarize themselves with its methods and results; to subject its manipulations, exercises, and devices to the same criticism and tests that obtain in all other branches of the healing art; and to adopt such a system of procedure as shall render its practice safe, dignified, and effective.

It is quite possible that mechano-therapy will continue to occupy its present anomalous and unsatisfactory position in America until American physicians are driven into doing their duty in order to defend themselves against incursions into their own domain. Nevertheless, the fact remains that our European brethren have accumulated sufficient knowledge and experience in this field to afford us valuable hints toward forming an aggressive and hopeful plan of campaign.

It is a noteworthy and encouraging fact that marked progress has been made within the department of mechano-therapy in Europe within the last thirty years; not to speak of the interest evoked in medical gymnastics during the second quarter of the century by reason of the labors of Ling and his disciples. It must be admitted, however, that this statement is chiefly true of the Scandinavian countries and Germany, and possibly of Holland. Evidence of this is to be found in the increased volume and improved quality of the literature relating to massage and gymnastics; in the increased number of trained physicians who devote themselves exclusively or in part to the practice of massage or the gymnastic treatment of disease; in the greater number and variety of diseased conditions for whose amelioration the mechano-therapeutist's aid is sought both by the professional and general public; in the beginning that has been made toward providing adequate instruction for medical students and specialists in practical massage; in the improvement and better regulation of the so-called Swedish movement-treatment at home, and in its increasing vogue abroad; in the enviable position which Thure Brandt, of Stockholm, has won for his mechanical method of treating certain diseases of women; and also in the development and wide extension of the system of mechanical gymnastic treatment that owes its name and success to the inventive genius and medical skill of Dr. Zander, of Stockholm.

Though there is still need, in many quarters, that the lay masseur and gymnast should amend his ways, still, his hey-day has passed on the Continent, as it has been amply demonstrated by gifted and distinguished practitioners that mechano-therapy may be prosecuted as a medical specialty, not only with success and profit, but also with honor. An intelligent realization of the truth of the above statement seems to me to be an indispensable preliminary to the rehabilitation and extension of mechano-therapy in the United States, and my purpose in translating Kleen's "HANDBOK I MASSAGE" from the Swedish has been to promote that end.

Massage is a more compact and manageable branch of therapy than medical-gymnastics, and, moreover, has awakened rather more of scientific experiment and discussion. Kleen's Handbook, though chiefly devoted to massage, contains a fuller and more critical discussion of medical gymnastics than any recent work, if we except Nebel's "*Bewegungscuren miltelst schwedischer Heilgymnastik und Massage mit besonderer Berücksichtigung der mechanischen Behandlung des Dr. G. Zander, Wiesbaden, 1889.*"

Kleen's point of view is that of the medical rationalist, writing for the benefit of the medical student and the general practitioner of medicine. His style is trenchant and readable, and his method of treatment is objective and scientific. Other noteworthy characteristics of the book are: the prominence given to the physiological and general therapeutical effects of massage; a full and emphatic setting forth of its contraindications; and the entire absence of the narrow, perfervid enthusiasm which so generally characterizes the work and utterances of the merely professional masseur. Kleen does not concern himself overmuch with the factitious mysteries and refinements of technique, and does not believe in the ready transformation of a tyro into an expert masseur through the mere study of printed and engraved descriptions of the manipulations of massage. Indeed, he has excluded illustrative cuts from the Swedish and German editions of his work. But, inasmuch as the opportunities to acquire a massage technique are not so numerous in this country as they are in Sweden and Germany, he has consented to the introduction in this edition of a few illustrations of a suggestive nature that have been prepared especially for it.

Basing my opinion on personal observation of the methods employed by leading Swedish, German, and American masseurs, I would say, in passing, that the technique taught by S. von Mosengeil, Professor of Surgery in the University of Bonn (who is the most eminent of Dr. Mezger's very limited number of pupils), seems to me to meet the anatomical and physiological requirements of massage more completely than any that I have seen or read of. Von Mosengeil's technique is especially strong as regards pétrissage of the muscles and fasciæ, and in joint-frictions; but these points are too technical to dwell on in a work of this sort.

When the exigencies of English seemed to demand it, I have not hesitated to take some liberties with the author's text. The present edition is based on the original edition in Swedish. I have derived material help from the German edition in revising my translation. I have embodied in my translation such alterations from the Swedish edition as occur in the German. Dr. Kleen has kindly furnished me with material for a few pages that have not been published hitherto. Aside from the illustrations, alluded to above, I have ventured to add nothing on my own part to what is contained in the other editions, excepting an index, which will, I trust, be of use to the readers of this work.

In translating Kleen's "HANDBOK I MASSAGE" I have been actuated by the belief that it was the most comprehensive, scientific, and readable book of its kind; and am particularly glad to learn that so high an authority as Dr. Weir Mitchell, who has kindly shown much interest in my translation, entertains the same opinion.

EDWARD MUSSEY HARTWELL.

Boston, July, 1892.

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KLEEN'S HANDBOOK OF MASSAGE.

CHAPTER I.

THE SIGNIFICATION, HISTORY AND PRESENT STANDING OF MASSAGE.

By massage* we mean a mechanical action which is performed on the soft tissues, for a therapeutical purpose, by means of certain manipulations, namely, stroking, rubbing, kneading and striking.

For the proper limitation of the conception of massage, it is of paramount necessity to discriminate between it and gymnastics, which involve the exercise of the organs of motion. At first sight it seems unlikely that the definitions of these terms should be confused or misleading. Both forms of treatment, however, have many points in common; both, of necessity, are often employed simultaneously in medical practice; they, have, likewise, very frequently, been practiced by the same professional persons—and herein (as well as in some other circumstances which I pass over for the time being) lies the reason for the failure of almost all writers, earlier and later alike, to distinguish between gymnastics and massage. In concrete cases, however, the distinction is often so striking that it is scarcely possible to escape grasping it. For instance, one may massage an exudation or a hæmatoma, since they are soft tissues, at least in a sense, but one cannot give them gymnastics, for they are not organs, least of all are they organs of motion and capable of being exercised as such. On the other hand, a muscle can be given both gymnastics and massage: in the latter case it plays either no part or an utterly inconspicuous part as an organ, being treated as a tissue simply, *e. g.* in the

* The French word *massage* is sometimes derived from the Arabic *mass* (to press); sometimes from the Greek μασσειν (to knead).

removal of an infiltration by frictions; while in the first case it is always treated as an organ and must functionate as such. The fact that massage, through the removal of the infiltration, heightens the functional power of the muscle, and so far forth, in this case, has the same end and the same influence that gymnastics have,—and the further fact that gymnastics, when employed simultaneously with massage, in their turn assist in removing the infiltration, in no wise detracts from the propriety of drawing a sharp distinction between the two methods of treatment.

I have emphasized the distinction between massage and gymnastics, for the reason that the attempt to blend the two, or rather the inability to separate them, still continues. Messieurs the gymnasts, in their zeal to secure all possible recognition for medical gymnastics—and in their not unusual confusion of ideas as to their office, will have it, perforce, that massage is "only a part of gymnastics," and declare that the "passive movements" of the latter include the former. For instance, we find the following in a manual which is in extensive use among medical gymnasts in Stockholm: "If a movement is executed with the organs of motion of the person taking the movement, *or upon any part of his body, by an agent external to him*, such a movement is called passive." If a knee-joint be subjected to massage, with frictions, surely no other movements are produced than those put forth by the masseur on the knee-joint of the patient, who can hold himself completely still the while. According to such a definition, these movements (frictions-massage) would be passive. My criticism on this is that when for the sake of clearness one undertakes to divide a subject into parts, he should be careful not to transgress the limits of his subject-matter; and when such a division of gymnastic movements is attempted, one must, to be consistent, take into account only the movements (be they passive or active, be they made with or without assistance or resistance) of him who exercises his own organs of motion, of him who takes gymnastics, of the gymnasticizing patient—in the case of medical gymnastics—for these are the movements which constitute gymnastics, and without the same there are no gymnastics. It does not answer to have reference to the movements of the patient one moment, and in the next instant to have reference to those made upon the patient by another person, *e.g.*, by a gymnast or masseur; nor, by the way, can these latter movements be called passive—neither do they belong to gymnastics more than any other movements. However, in order to leave no room for the common misapprehension, and for the sake of consistency, I think it best to speak of the *manipulations* of massage, and of the *movements* of gymnastics.

Writers who are meritorious in other respects have contributed to the existing confusion through their use of misleading expressions. Thus, a well-known and justly esteemed German colleague* has proposed, recently, to substitute a collective noun, in order to indicate both forms of treatment, for the expressions massage and gymnastics, "which names only too often stand for confused ideas." Movement-

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*H. Nebel: "Ueber Heilgymnastik und Massage." Leipsic, 1886. (Volkm. Samml. Klin. Vorträge. Volkmann's Collection of Clinical Lectures.)

cure (Bewegungskur) is the term he has chosen, in conformity with the example of some other German writers. But the term movement-cure means, or ought to mean, a cure effectuated by and through the patient's *own* bodily movements. This word may, therefore, be used of any gymnastic-cure whatever, as for instance, for the so-called *Terrainkur* of Oertel; but it is applicable in no sense to a massage-cure, because, in the course of such a cure the patient need not make any subjective movements whatever. What propriety is there in saying that a woman, who has had a parametritic exudation massaged away, has undergone a movement-cure? That massage can serve as a movement-cure for the masseur, Messieurs the masseurs all know, but that is not to the point. I am, therefore, of the opinion that the above-mentioned collective name proposed for massage and gymnastics is as infelicitous as possible, and that our worthy colleague has not contributed, by his proposal, toward doing away with the confusion of ideas of which he complains.

The only correct course is to hold fast to the distinction between massage and gymnastics, and to consider both as branches of mechano-therapy, along with orthopædics.

Some authors have even classed certain mechano-therapeutical manipulations with massage, which do not properly belong to it, and which even the gymnasts have not claimed for gymnastics. This is the case, as I think, with certain manipulations which are employed for the purpose of removing an organ, or a part of an organ, from an abnormal position, *e. g.* taxis, in hernia; the manipulations made upon the abdominal walls for the sake of removing an invagination of the intestine or an ileus; repositions of the uterus, etc. I also look upon certain obstetrical procedures, which are not unlike massage in form, viz. Kristeller's *expression* of the fœtus and Créde's method of loosening the placenta, as not belonging to massage. For my part, I cannot consider as massage the strokings by means of which one can remove air through the open wound in case of a traumatic emphysema. Finally, I exclude also from massage the method—"heroic" in more senses than one—employed in England by Teale, Sir William Fergusson and others, which consists in kneading an aneurism sac for the purpose of loosening a part of its contents, to form an embolus in a peripheral portion of the artery, and so secure the eventual complete consolidation of the aneurism.

The conception of massage, in its entirety, embraces not only the manipulations of massage, but also their modes of action. The reader will, as I hope, acquire clear views of the content and limits of this conception, through a study of the chapter on the physiological and general therapeutical effects of massage.

The History of Massage * is certainly as old as that of man; since its technique is so simple, the indications for it, to some extent, so much a matter of every-day occurrence, its effects so obvious, that, even in the lowest stages of development, men instinctively resort to it, the more so as, in a double sense, it is always "at hand." Moreover, we find accounts of massage in the oldest of known writings.

In the cursory sketch, which I append, it is impossible to separate the history of massage from that of gymnastics. Both of these departments of mechano-therapy

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* The material for this historical account of massage has been derived, for the most part, from books in the library of the Central Gymnastic Institute, in Stockholm, which is particularly rich in its collection of the older original works in this department. In some cases I have had recourse to Dally, Estradère, Busch, Hünerfauth and other modern authors;—without being able to verify all my references, I regret to say.

have many points in common, as has been remarked already; and many such points are found in their historical development. On the whole, gymnastics have emerged within the domain of science earlier than massage, since the scientific requirements of the first are much more easily fulfilled than those of the latter. Men have been quicker to learn the worth of muscular exercise, to set forth its indications and to prescribe it, than in attaining a comprehension of the physiological effects of massage and of the meaning of its various manipulations, which presupposes a far wider knowledge of anatomical, histological and physiological facts.

It is in Asiatic literature of hoar antiquity that we find the first known works which touch upon mechano-therapeutics. Among them is the oft-referred-to Kong-Fu,* of great age, but uncertain date, possibly 2700 B. C. It is a description of gymnastics, and contains illustrations showing a variety of positions. Whether it contains anything about massage I cannot say; but it is certain that its importance in this connection has been greatly overrated.

In a document discovered toward the close of the eighteenth century, which forms a part of the collection of the Hindu Vedas, or "books of wisdom," and in which, among other things that Susruta sets forth concerning the medical experiences and opinions of Dhavantare, his teacher, we find notices of gymnastics and massage, which latter was included in the religious precepts of the laws of Manu.†

We also have positive evidence of the existence of mechano-therapy among the ancient Persians; the name of a famous Phenician masseur and gymnast, Elix, has been preserved: and finally, we know that the ancient Egyptians knew about massage as well as gymnastics. [Alpinus, Haecker.]

In this as in other branches of medicine, the Greeks were the first in Europe‡ to make genuine progress. Among them we find the oft-cited general massage, which was made use of in the baths, the gymnasia, and the home, and was to some extent practiced by specialists (pædotribai). So, too, local massage, and many therapeutical facts concerning it, was known in ancient Greece. It gives me especial pleasure to introduce to the reader a well-known and "highly-esteemed colleague," from ancient Hellenic times—no less a person than Hippocrates (460–377 B. C.) as one of the most prominent defenders of this massage. He refers to the use of frictions in sprains, reduced luxations, constipation, etc., and cites a brief list of cases. Possibly he had been indoctrinated with his partiality for mechano-therapy by Herodicus, his preceptor, who seems to have been a gymnastic enthusiast.

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* Lepage: "Historique sur la Médecine des Chinois." Paris, 1873.

Nebel, who has studied the history of mechano-therapy much more profoundly than I have, has given me the following:—

1. Kong-Fu properly means mechanical treatment; wherefore we can use this term, for the Chinese work in question, in a secondary sense only, analogous to that in which, for example, we speak of Billroth's Surgery;

2. Peter Amyot, who is frequently assumed to be a contemporary of Abbé Huc, was one of the principal authors of the "Memoire concernant les Chinois," published in 1776;

3. Huc, on the other hand, wrote his "L'Empire Chinois," in 1831:

4. Tao means: member of the Sect of Tao, which was founded some centuries before the Christian era by Tao-tse, or Lao-tse, or Lao-kinn.

† Dr. Wise: "Commentary on the Hindu System of Medicine." Calcutta, 1845. Cited by Dally, Liétard, and others.

‡ For details regarding mechano-therapy in ancient Europe, consult C. Keyser's Latin translation of Flavius Philostrates. Heidelberg, 1840; as well as "Œuvres d'Oribase." Bussemaker et Daremberg. Paris, 1851.

Among the manifold acquisitions of culture which Greece presented to her conquerors, the Romans, were several of a medical nature; and the flourishing condition of mechano-therapy in Rome was largely due to Grecian influence. Certain of the most renowned physicians of Rome were Greeks. Among them I will mention Asclepiades, who was in practice shortly before the birth of Christ, and made extensive use of massage. We find evidence in Roman literature * that, from the dawn of our era both gymnastics and massage were held in high repute by the profession and by the laity. Mechano-therapy derived the greatest advantage from the attention bestowed upon it by the foremost physician of the Roman Empire, namely, Galen (131–201 A. D.). As is well known his influence was extended over many centuries after his own, and it is partly due to him that this form of treatment did not become extinct during the middle ages. In the fourth century of our era, Oribasius wrote his celebrated work, which is the principal source of our knowledge of the mechano-therapy of the ancients. From a work of the fifth century, upon obesity, we learn that medical gymnastics were still alive in that period; and in the seventh century, Ætius wrote about active and passive movements, about resisted movements and frictions. [See below regarding Ling.]

The further we advance in the mediæval literature the fewer signs of life in mechano-therapy do we find. It shared the fate of all science, not only in making no further progress, but in losing most of the ground previously gained. It is easy to understand that the seed-corn of preceding generations would fail to germinate in ages when men, showing more and more aversion to the lessons of experience, wandered off into pure speculation, and finally landed in complete mysticism. It is true that the Arabs, whose dominion in medicine lasted for several centuries—beginning with the ninth century—followed the doctrines of Galen in the main, and therefore could not leave unnoticed any form of treatment that he had highly prized. Avicenna (b. 980) in particular interested himself somewhat in mechano-therapy. The monks, too, who in this period were the foremost practitioners of medicine, were in their capacity as physicians followers of Galen. Nevertheless, the Arabs, in their therapy, relied chiefly on the resources of pharmacology; and the monks found prayer and incantation easier than massage and gymnastics.

In the fourteenth century anatomy began to free itself gradually from the Galenic traditions, and, in the course of this and the next centuries, won a comparatively sure place for itself. Thus one of the conditions for the development of mechano-therapy was fulfilled, and very soon signs of new life in this department began to appear—the great Ambroise Paré (1517–1590) warmly espoused the cause of mechanical treatment, and attempted to base it on anatomical and physiological grounds; an event of much more importance than the predilection that the conspicuous humbug Paracelsus showed for gymnastics about the same time. Furthermore, in the sixteenth century, we find a number of physicians and men of science, whose names are worthy of mention in an historical sketch of this sort: Leonhard Fuchs, in Germany; Timothy Bright, in England; Champier du Choul and Faber de Saint Jory, in France; Antonius Gazi, Prosper Alpinus, Hieronymus Mercurialis ("De arte gymnastica. Venetiis, 1569"), and Fabricius ab Aquapendente, in Italy. The last named, as is true of several others, has been looked upon by many as the "inventor of massage."

We come now to the time of the appearance of the greatest genius of modern times. Even within the limited field which here concerns us, we find traces of the wide

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* Aulii Cornelii Celsi: "De medicina," translated into German by B. Ritter. Stuttgart, 1840.

activity of Lord Bacon, of Verulam; and it is most interesting to note how his marvelous acuteness of mind has asserted itself here. I quote from one of his countrymen (Murrell) Lord Bacon's opinion of massage: "Frictions makes the parts more fleshy and full, as we see both in men and in the currying of horses. The cause is that they draw a greater quantity of spirits and blood to the parts; and again, because they draw the aliments more forcibly from within; and again, because they relax the power, and so make the better passage for the spirits, blood, and aliment; lastly, because they dissipate and digest any inutile and excrementitious moisture, which lieth in the flesh, all which helps assimilation." Though these words were penned nearly three hundred years ago, and are expressive almost equally of the misty and erroneous views of that time and of native discernment of mind, it is easy to translate them into the scientific language of our own time, and to find in them intimations, to say the least, of the virtue of massage in counteracting atrophy, in hastening the circulation, in promoting the resorption of pathological tissue-elements, and of heightening the general nutrition.

The literature of the eighteenth century, particularly of the latter half, contains abundant evidence that the mechanical method of treatment was pretty generally disseminated, although, perhaps, not to the extent that, from certain other manifestations of that period, we might expect. The mechanical point of view attained more and more prominence in physiology, and the so-called *Iatro-Mechanici* did good service in this field as well as in anatomy. But their therapeutics were amazingly little influenced by their theories, and it is safe to say that gymnastics and massage owe but little to them. Borelli (1608–1679), meanwhile, wrote his famous "De motu animalium," a ponderous work which appeared in 1670, in which the mechanics of movement and of respiration were fully set forth, which must have exerted some influence upon the development of rational gymnastics. Baglivi, another Italian, was very well affected toward movements and frictions, which, he says, "give tonus and suppleness to limbs and tissues." In England, according to Tissot, massage received a certain impulse during the century in question, of which we have corroborative evidence in the literature. For instance, in 1666, we have a remarkable work by Dr. Henry Stubbe, a practicing physician, in Stratford-on-Avon, which bears the instructive title of "An Account of Several Miraculous Cures Performed by the Strokings of the Hands of Mr. Valentine Greatrick." It is also noteworthy that Sir William Temple, the father of the Triple Alliance, who, whenever he descried a gathering storm in the political heaven, or for other reasons found the burdens of statemanship too heavy, was wont to retire to "his little nest at Sheen", in order to divide his time between gardening and literary occupations. It is noteworthy, I say, that this heedful man should write, among many other effusions, a treatise "On Health and Long Life," in which the worth of massage is strikingly lauded and particularly recommended for the treatment of joint ailments. Finally we will mention two worthless but curious works—one belonging to the early, the other to the later part of the century. In 1615, Guyon wrote his "Miroir de la beauté", wherein massage is pressed into the service of beauty (in which it is rarely of any particular use). The second is the well-known "Flagellum Salutis" (1698), in which Paullini extols its importance under all sorts of circumstances, but most especially in the voluptuary art. Paullini, they say, was a poet. It is to be hoped that his achievements in that field were more considerable than they were in mechano-therapy. He assumed a very näive attitude, and is one of the first of a long and tiresome set of uncritical enthusiasts who consider massage (which with Paullini was synonymous with *tapotement*) to be a panacea for nearly every disease—syphilis not excepted.

In passing to the eighteenth century we come upon a great name, that of Friedrich Hoffmann (1660–1742), "Dissertationes physico-medicæ," Halle (1708). Hoffmann declares that on account of their influence upon the circulation, the appetite and the general condition, gymnastics are the best of all remedies; and also treats of massage after the manner of Hippocrates, Celsus and Galen. Without doubt he contributed greatly to the development of mechano-therapy in Germany, England and France. In the first-named country several works appeared during this period. In 1748, Börner's "Dissertatio de arte gymnastica," and Gehrike's "De gymnasticæ medicæ veteris inventoribus" were published at Helmstadt. In 1749, Quellmaltz's "Programma de frictione abdominis," appeared at Leipzig. In England we have Fuller's work, "Medicina gymnastica, or Treatise concerning the power of Exercise," an echo from Hoffmann. In itself this work has no great worth; still it passed through several editions, and was no doubt influential in extending the practice of exercise among the general public. In France mechano-therapy flourished greatly. Andry published his notable "Orthopædie," in Paris, in 1741. Winslow, also a well known Parisian physician, employed the mechanical treatment for deformities, (Dally). Rousseau recommended bodily exercise with great warmth, and thereby gave a strong impulse to pædagogical gymnastics. The famous Tissot (a Swiss) wrote his "Gymnastique medico-chirurgicale" (Paris, 1780), in which he treats at length of massage (by means of "moist" or "dry," weak, medium and strong frictions). Dr. Tronchin, who was exceedingly popular in Paris, assiduously used gymnastics and massage, which, at this time, became "the fashion" in that city. Towards the close of the eighteenth century an active interest in gymnastics sprang up in Germany, which circumstance should be mentioned on account of the above mentioned connection between gymnastics and massage. Beginning with 1770, a great number of men were active, especially in bringing about the introduction of gymnastics into the schools, till they became common throughout all Germany. I would mention in this connection the well known names of Frank, Basedow, Salzmann, Guts Muths, Vieth, Pestalozzi, Jahn, Eiselen, Massmann, Lorinser, Spiess, and others whose activity falls partly within our own century.

Guts Muths is, from his writings, the best known of the German gymnasts; and one frequently meets with his work, "Die Gymnastik für die Jugend" (Schnepfenthal, 1793), in collections of books. In his exposition of hygiene we mark the strong influence of Hoffmann. As regards gymnastics, and in his discussion of running, throwing, jumping, balancing, etc., we find striking reminders of the antique. Guts Muths deals very clearly and intelligently with certain physiological factors in gymnastic exercise; emphasizes (p. 211) the necessity for a harmonious muscular development, and mentions passive and active movements (p. 268). At the end of his book (p. 626), he notes the possibility of working out, with the aid of an anatomical atlas and an expert physician, a system of gymnastics founded on anatomical principles, and gives a sketch of such a system. He seems to have had no knowledge or experience of massage.

A similar movement arose in France. Amoros did good service in the field of pædagogical gymnastics, as did Delpech and Londe (Gymnastique médicale, 1820*),

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* Londe describes (pp. 249–255) "frictions et onctions" as well as "le massage et le massement." Sufficient evidence of the complete desuetude of mechano-therapy, in France, in the early part of this century, is furnished by the curt way in which massage is dismissed in books of this sort. He rejects the "onctions" of antiquity; concerning "frictions" he remarks that they are of use for persons who cannot take exercise, in certain diseases (concerning which diseases he has not a

in that of medical gymnastics; though their achievements were not then considered highly important.

Swedish traditions, in the department of mechano-therapy, began with Peter Henry Ling (1776–1839). As early as 1804, Ling appears as teacher of gymnastics and fencing in the University of Lund. In 1813, he founded the Central Gymnastic Institute, in Stockholm, and was active as its director till his death. His chief work, "On the General Principles of Gymnastics" (Om Gymnastikens allmännna Grunder), was published in 1840, after his death. As he is often mentioned without being fully understood, and as he has an especial interest for the readers of the Swedish edition of this volume, I shall speak with some fullness of his relation to mechano-therapy.

The Ling gymnastics, in contrast to the German, became preponderantly therapeutical, as is evinced in the caption Swedish Movement-*cure;* though Ling also paid extraordinary attention to pædagogical gymnastics. He proposed a great number of movements, which he divided into passive, active, and duplex, according to the usage of antiquity. Less known, but of greater interest for us, is the fact that Ling was conversant with massage, whose manipulations (friction, chopping, pinching, squeezing, pulling, l. c., p. 581), he classed under passive movements. Massage constituted a very essential part of Ling's mechano-therapy, and was employed in many forms. For instance, Ling mentions throat-massage (p. 530), which he recommends for headache and dizziness. He was familiar with "abdominal-massage," and made use of local and general-massage also, employing very nearly the same technique which is now in vogue among Swedish physicians and all of the so-called Mezger school. Through the Central Gymnastic Institute, which he created, Ling exerted a great, if not always a salutary, influence upon the spread of the mechanical method of treatment in Sweden. Physicians and laymen, from other countries, also, repaired to Stockholm in order to study Ling's medical gymnastics, which were thus spread over the greater part of Europe. Ling was warmly devoted to his calling, displayed an indomitable energy in furthering the interests of mechano-therapy, and knew how to communicate to others the lively interest by which he was himself inspired. The sum of what I have noted constitutes the amount of Ling's essential and, in themselves, very considerable services.

But, on the other hand, Ling's activity suffered from certain unfortunate defects. He lacked scientific training, and was ignorant of medicine. He was able, indeed, by reason of his conscientiousness, his enthusiasm, and his strong will, to do good work himself. But he was not able, properly speaking, to advance his science. In the name of truth, I am forced to say that nothing—absolutely nothing—of what Ling left was new. All that he employed and taught, existed long before his time; and, though it is possible, or, indeed, probable that Ling did not know of the documents in Chinese,* his own writings testify that he was familiar with the ancient, Euro-

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word further to say); they are especially good, however, for people "who live in Northern, swampy regions, and for their weakly children with blonde hair, blue eyes, and big, heavy bellies, who are physically and intellectually so quiet." As to the significance of massage in other respects, the author seems to know only about—Tahiti; he considers it a tonic, but disapproves of it because it promotes amorous sensations. Hünerfauth, in his "Handbuch der Massage," says, to my utter astonishment, that Londe has written "quite exhaustively" upon massage—a most misleading judgment.

* Kong-Fu contains so much about mechano-therapy, that certain French authors have charged the Swede, P. H. Ling, with being only a plagiarist of the same. The translation of the Chinese work by the French Jesuit, Amyot, appeared long before Ling's writings, so that it is impossible to deny absolutely that he knew of it. Nevertheless,

pean works on mechano-therapy. Neither his gymnastics nor his massage can be considered as more than a modification of the same. It cannot be denied that Ling must have known the German gymnastics and was influenced by them. It did not lie in Ling's power to contribute to the clearing up of the uncertainty concerning the physiological and therapeutical effects of the mechanical method of treatment, or to set forth and limit the indications for its employment; and his notions in these matters were utterly fantastic In his works he strove to make good his lack of scientific method by purely speculative subtleties, which had not even the merit of originality, but formed only a part of the last billows of the flood of nonsense with which the so-called natural-philosophers deluged the world. His writings, therefore, not only are not in advance of his time, but do not compare favorably with the productions on mechano-therapy of several of the earlier writers.*

A few brief extracts from Ling's "On the General Principles of Gymnastics," may give the reader a good idea of Ling's standpoint. The book is divided into six parts, which treat: (1.) of the laws of the human organism. (2. 3. 4. 5.), of the principles of pædagogical, military, medical, and æsthetic gymnastics, and (6) of the vehicle of gymnastics. The first part contains what was to Ling, a complete philosophical system, in which the three ground forms of vital force play the chief rôle. These

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it is not to be found among the books that Ling left behind him, which I have seen, and which may well have made up the greater part of his library: nor does he cite it, though he makes mention of many ancient European works in this department; finally, Ling's personality was such that we may not suspect him of appropriating the honor of ideas belonging to another, not even through silence. There is as little probability as proof that Ling knew of Kong-Fu. With like good reason we may scout the statement of Dally that "l'idée suèdoise est née au contact de l'idée française." It would be much more correct, I may say in passing, to say "l'idée française est née au contact de l'idée chinoise." Nevertheless, it strikes me, who am no one-sided admirer of Ling, that it was a much greater achievement to revive mechano-therapy in his fatherland and throughout all Europe, and to win wide recognition for it, than to come upon the thought that systematic exercise of the organs of motion may have a therapeutical or other value, which, moreover, was known in Europe before Ling's time, or to devise a lot of different movements, which is no great matter for a person who is familiar with anatomy. As regards Ling's achievements, which certainly are far from being so considerable as most of his countrymen fancy, it is, therefore, a matter of comparative indifference whether he had read Kong-Fu and knew about the Tao-Tse students and their exercises, or not.

* Ling was "a character," and gained the respect and affection of his pupils to a high degree. These feelings have been transmitted to the present generation of Swedish gymnasts, who often express an admiration for Ling that is beyond all reason. It is both touching and laughable to see with what veneration these gentlemen receive even the most visionary effusions from Ling's pen. This veneration is only augmented by the circumstance that they, pardonably enough, do not comprehend in the least what their idol really means, and they strongly remind us of Peter Gynt, when listening to Begriffenfelt's profundities:

"Verily an extraordinarily gifted man!
Almost all he says is beyond me."

Ling's reputation for just the merits which he lacks, extends, in certain circles, far beyond the confines of Sweden. For instance, I recently found an indulgent Spaniard (Busque y Torro: "Gimnastica higienica, medica y orthopedica," Madrid, 1856), who pronounces Ling a "hombre erudito, de vastos conocimentos y de solida instruccion." For my part, I think we shall do best in judging of Ling (who possesses *truly* great merits), as in other things, to look at matters as they are, and I have written as I have about him, not to disparage a justly famous name, but because I believe a more sober estimation of his service will, in certain relations, be for the good of his art.

are (p. 444): "the dynamic, in which life, giving, as it were, an expression of its independent being, strives to liberate itself from matter; and the chemical and mechanical, in which life manifests itself in union with matter. In chemical force, however, life appears to occupy the foreground, while in mechanical force matter preponderates; wherefore both of these forms may be considered as separate forms, existing under independent conditions." In the organism, the nervous system corresponds to the dynamic ground-form, the circulatory system to the chemical, and the muscular system to the mechanical: health consists in the mutual harmony of these three "agents." When this harmony is disturbed, disease arises in the following manner: "when the dynamic force is the chief agent, disease takes a mechanical form; if the mechanical is the strongest element, disease takes a chemical shape; and if the chemical is the chief agent, the disease declares itself under a dynamic form," (p. 523). Ling evidently feels that he is not on entirely safe ground here, and prudently remarks that as so many learned men have erred in these matters, his opinions were also entitled to be received with proper allowance—"where there was need of it.

Ling expatiates upon the elemental-forms and their relations to diseases and their symptoms: "A disease in its origin belongs commonly to and manifests its symptoms under a single ground-form, although it may not be the same as the one in which it originated; such a disease we term mono-symptomatic. But if a disease belongs to one elemental form and its symptoms reveal themselves under the other two, or even in all three, elemental forms, then we term it poly-symptomatic."—(pp. 519–520). Concerning these troublesome poly-symptomatic ailments, Ling knowingly remarks that—"in general it might be safest to resort to the mechanical mode of treatment last of all, and to use the chemical method when the patient is weakest." Ling, as we might expect on *à priori* grounds, and from his vague utterances as well, attributes to mechano-therapy all that belongs to it and a good deal more; but in this connection he is more prudent than modern "gymnasts." In particular, he excludes febrile diseases from mechanical treatment, being happily of the opinion that in such affections "the mechanical agent is strong, the chemical below par" (p. 542). On the other hand, he holds that scabies (of whose parasitic nature he seems to be ignorant, although it had been demonstrated long before), is within the domain of mechanical treatment. This disease is caused by "a preponderance of the inner chemical agent," and can therefore be arrested by means of movements, that is to say through augmenting the mechanical agent. He had seen seventy or eighty cases of scabies, that were cured by such treatment, and advises, presumably on the ground of his experience gained under these remarkable circumstances, that the treatment should consist of preliminary movements at first, and "gradually be changed into completely active gymnastics." Ling is fond of symbols and similes. Among other statements, he gives the surprising information that the thumb signifies firmness and determination, that the index-finger is instructive, that the middle-finger expresses calmness and deliberation, and the little-finger ease and grace. Even his fertile imagination seems to have failed when it came to ascribing "a character" to the ring-finger. Wherefore Ling, with noteworthy presence of mind, confines himself to remarking that this finger is only seldom used by itself.

Ling's medical gymnastics were developed and propagated in Sweden, by his pupils, Branting, Hjalmar Ling and others, and attracted the attention of several physicians, among whom Sondèn and Liedbeck especially should be named. Abroad, both Swedes and others were active in this time Georgii, in Paris, Eckhardt, Schmidt, Rothstein, Eulenburg, and Neumann, in Germany, Melicher in Austria, Indebetou and Roth in England, Eichwald, de Ron and Berglind, in Russia.

Three Prussians, Rothstein, Neumann and Eulenburg * are particularly well known. Rothstein had no medical training, on which account his achievements, which were considerable, as regards practical matters, suffered on the side of theory. Neumann was a physician, but belongs to that deplorable type who, in view of the brilliant results of mechano-therapy, lose all critical power and advocate this form of treatment in season and out of season. He did not hesitate to proclaim that it would cause a revolution in the treatment of *all* chronic diseases; beyond question he injured his cause in no small degree. After having looked through Neumann's two thick volumes, with somewhat of consternation, it was refreshing to read Eulenburg's article on Swedish medical gymnastics, which bore witness to the author's sound professional training, sober judgment, and scientific mode of thought.

We find no essential advance on Ling's mechano-therapy in the first half of this century. In France this form of treatment, after a short period of florescence in the eighteenth century, declined. I have already mentioned the negative standpoint assumed by Londe in 1820. In Germany and Scandinavia, the medical gymnasts were active in a more or less rational way, but massage, on the whole, received little attention. Finally, in England, where sports fill the place of gymnastics, in a measure, mechano-therapy made no especial progress; although several noteworthy works † were published that show that it was not dead, and though, furthermore, as has been mentioned, two of Ling's pupils were in practice there.

The new era of mechano-therapy begins with the middle of this century. Its history conveys the same impression as the history of medicine in general, namely, that the greater part of what has been gained, has been gained within this period. Prior to this time—beyond receiving slight attention from a few scattered physicians—mechano-therapy was in the hands of laymen who were unable either to comprehend its real significance, or to introduce it to the scientific world; from this time dates its more frequent appearance in the service of science.

A beginning was made in France, where a brisk initiative is frequently united with a lack of staying power. In the fifties, the mechanical treatment of chorea, which had been attempted some decades previously, became increasingly general. Bonnet, who had shown entire indifference in his earlier works, recommended gymnastics and massage in the treatment of certain joint diseases, in his classic "Traité de thérapeutique des maladies articulaires", published in 1853. The well-known works of Dally and Laisné appeared during this period.

But it is to Teutonic peoples, especially the Germans, that we owe the greatest achievements in this as in so many other fields. A strong impulse was first given by the famous Dr. Mezger, of Amsterdam, who was already an active masseur in the early sixties. He understood marvelously well how to win the confidence of the public,

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* Rothstein wrote, among other works, "Die Gymnastik nach dem System des Schwedischen Gymnasiarchen Ling," Berlin, 1848–59, and in conjunction with Neumann the periodical "Athenaeum für rationelle Gymnastik." Neumann published "Heilgymnastik oder die Kunst der Leibesübungen," Berlin, 1852. Among Eulenburg's works was, "Die Schwedische Heilgymnastik," Berlin, 1853.

† "The Muscular Motions of the Human Body," by Dr. John Barclay, Edinburgh, 1808. "Illustrations on the Power of Compression and Percussion on Rheumatic Gout and Debility of the Extremities," by Dr. Balfour, Edinburgh, 1809. "A full Account of the System of Frictions as Adopted and Pursued with the Greatest Success in Cases of Contracted Joints and Lameness from various Causes," by the late Eminent Surgeon John Grosvenor, Esq., of Oxford. William Cleobury, 1825, "Therapeutic Manipulations, or Medical Mechanics," London, 1840, by Ling's pupil, Indebetou, a Swede.

and through his German and Scandinavian pupils has exercised a powerful influence upon the standing of massage in the medical world. The hitherto so little heeded mode of treatment was now taken under the protection of certain of the foremost representatives of the great German and Austrian clinics, and was employed by practitioners whose names ennobled it. When Langenbeck and Billroth pointed out the importance of massage, and thereupon Hueter, Esmarch, Barbieri, Volkmann, Von Mosengeil, Gussenbauer, and others began to employ it, and its effects were scientifically set forth by these and others, the conviction gained ground, in Germany and Austria, that massage was as much entitled to a fair trial as the other branches of mechano-therapy, or as chemical, thermal, electrical, or any other form of treatment; and that the circumstance that massage had been much abused and over estimated by ignorant people, really had nothing to do with its actual significance. In the North, where Ling had prepared a good foundation, Helleday and Berghman, in Sweden; Evald Johnsen, in Denmark; Winge and Kiär, in Norway, won extended recognition for massage. The result was that massage became irrevocably fixed as an integral part of the healing art in all Germanic lands,* and that whereas the practice of it had formerly been chiefly confined to mechanical quack-salvers, its practice is now, in those countries at least, almost entirely in the hands of educated physicians, who either practice it in connection with other specialties, or devote themselves to it as an exclusive specialty.

Meanwhile, massage has scarcely begun to hold the place it is entitled to in therapeutics, so far as the rest of the scientific world is concerned. In France, it has still to win general recognition, and in the countries of the South of Europe it is but little known. The situation is scarcely better in England, where mechano-therapy is mainly in the hands of persons having no medical training. Recently, however, several distinguished English physicians have begun to show interest in this matter, and Professor Playfair has been particularly active as an advocate for its more general use.

In America I was soon convinced of the correctness of the judgment of Dr. Charles Carroll Lee, a prominent gynæcologist in New York, who in reply to a question of mine said: In this country massage is still in an embryonic state. Nevertheless, Dr. Lee and some other gynæcologists make use of massage in their practice. In Philadelphia, so great an authority as Professor Weir Mitchell, has adopted massage, especially of the "general" sort, as an essential factor in the treatment which usually bears his name, *i. e.*, the fattening, rest, and isolation cure. As early as the middle of this century some American physicians, for instance, the elder Sayre, used massage in their practice. In Boston, Dr. Douglas Graham, a Scotchman, has written a book on massage. Massage, both local and general, is his specialty. In America, moreover, as in England, gymnasts of various nationalities, often the Swedish, have begun to show activity. An enormous deal remains to be done before mechano-therapy shall attain the same standing in America that it now has in Germanic countries; still, nearly everything, including medicine, in the New World developes with surprising rapidity, and it may not be so very long before the Americans will have appropriated, in this as in other departments, all that is worth appropriating.

A voluminous literature concerning massage has sprung up in recent years. On this point I refer the reader to the bibliography at the end of this work. Only a very

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*Among these I reckon—"honi soit qui mal y pense"—both Holland and the Scandinavian States.

few of the works there cited give anything like a detailed exposition of massage; many of them betray the undeveloped state of this method of treatment so far as the practice of their authors is concerned; and, not infrequently, one finds, if he is so fortunate as to get hold of their writings, that certain authors have plainly been influenced by that well-known aphorism "mitunter ist es besser Nichts zu schreiben, als nicht zu Schreiben;" "Sometimes it is better to write nothing than not to write."

So much for massage in literature and the world of science. It may be of interest, however, to glance at the history of massage, as a branch of "Folk-medicine," in which capacity it is more or less generally diffused and developed among most, if not all nations of the earth.

In Europe we meet with massage everywhere, and it owes its most striking "marvelous cures" to many a "wise man" or old woman, in town and country. In our quarter of the world it is most general, probably, among races of Mongolian origin. It is in common use in the baths of the Hungarians and the Finns, and exists among them in various other forms as well, for instance, as "abdominal massage." I have seen it employed among the Laplanders for muscular affections of a "rheumatic" nature.

In Africa, general-massage is used by races of the lowest civilization, in connection with the bath (and among all "oriental" peoples also); local massage is also employed. Certain French writers (Seré, Quesnoy) state that massage is found all over the Dark Continent. Among the wild tribes of the interior and southern regions, however, it does not seem to be in very general use; yet we occasionally find hints of its existence in the tales of travelers. *

Massage is very common in Asia, where it has reached a considerable degree of development among the most advanced races, being to some extent practiced as a profession. This is the case among the Chinese, with whom, as with us, the barbers are especially given to dabbling in physic. Travelers in Japan often notice the presence of certain blind men who roam about the streets of the larger towns in the evenings, and now and then make their presence known to the public by blowing certain notes on a peculiar wind-instrument. They are Japan's "meek masseurs," the so-called Ammas, who are by no means inexpert in palpation; though their stock of knowledge is even smaller than that of their European colleagues, the so-called "gymnasts." One of my friends who lived for some years in Japan as a physician, complained of constipation on one occasion while at a tea-house, and was much surprised by the kindly offer of one of the waitresses to relieve him by means of abdominal kneading! Matters are much the same among the Hindus. † Dr. Stolpe, of Stockholm, who has made a number of interesting photographs in India, has shown me a picture from the beach of Benares, which shows a Brahman having massage given to one of his legs by another dark-skinned person, probably a "professional." The Malays also make extensive use of massage or "pidjet-ten," as they call it.‡

The aborigines of America are not entire strangers to massage. It is found among the Redskins of North America, although it does not seem to form an essential part

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* Thus Charles John Andersson in his work "The Ngami Lake" (p. 306 vol, II, Swedish edition), mentions a procedure of the Namaqua doctors which is evidently a kind of abdominal-massage.

† Hünerfauth: Geschichte der Massage, Berlin, 1886, p. 8; concerning Dr. Stein's experiences in Java.

‡ Athenæum für rationelle Gymnastik. Berlin, 1854, vol. IV.

of their therapy.* Furthermore, we have reports of its existence among the South American Indians, among whom it would appear to be quite generally diffused, judging by repeated notices given in descriptions of travel.†

In Australia, massage is found among the primitive aborigines of New Holland‡ as well as among the more civilized tribes § of the Pacific Ocean. Among the last named tribes it is employed both as general-massage (chiefly as "a restorative), and for local purposes. Its technique seems to have attained a considerable degree of development, the different manipulations being classified by the Tongas, quite after the method of the modern Mezger school

In one respect massage holds an extremely peculiar position : it is very frequently practiced—in some countries almost exclusively—by persons who have had little or no medical education. I pass by the troops of " wise men," barber-surgeons, and the like, who occasionally try their hands at massage, and propose to devote a few words to a particular class of professionals who are now quite numerous in all Germanic countries, and who devote themselves as well to gymnastics as massage, but usually call themselves " gymnasts."

Obviously, the gymnast occupies a favorable position which cannot be compared with that of the quack-doctor who meddles with internal medicine. The former has no need of using medicines, which, though highly prized by the public are a source of danger to the quack, and, on account of the innocent nature of his manipulations, and the peculiarity which they possess of seldom leaving any visible traces, he is not nearly so often, or in so high a degree obliged, as is the quack-doctor, to exercise caution in displaying his ignorance. Moreover, the gymnast can always make capital

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* I have received definite accounts on this point from American physicians, especially of the use of "tapotement" for therapeutical ends. Similar accounts are also given in some of the best known descriptions of life among the North American Indians, which, however, in spite of assiduous search, I am not able to verify. In Schoolcraft's great work, " The Indian Tribes" (Philadelphia, 1853–60), there is nothing among the tolerably detailed reports on Indian therapy which can be classed under massage.

† Franz Keller Lenzinger, in his " Vom Amazonas und Madeira" (Stuttgart, 1874, p. 118), mentions a remedy employed by a medicine-man, "payé," of the Cazowa Indians living on the Madeira river, for " painful rheumatism." Aside from some mystical by-play, it consists of an extremely vigorous massage-sitting given to the patient. As the medicine man began to stroke and knead him from his head to his toes with such force " the sweat poured down in streams from the exorcist as well as the patient." It is noteworthy that the Indian " payé " pretended to his childlike countrymen that he drew the disease into his own body, just as a notorious Swede with scarcely less authority does with the highly civilized dwellers in London. Dr. K. Von den Steinen reports in " Durch Central Brasilien, Leipzig, 1886, p. 260," how a medicine-man of the Yuruna Indians gave a sick woman a kind of "general-massage."

‡ Baudin : Voyage dans la Nouvelle Hollande. Paris, 1800.

§ We have numerous accounts concerning massage as it exists among the islanders of the Pacific Ocean. The very first seafarers who visited Tahiti became acquainted with it there. Thus Wallis, who visited that island in 1767, mentions it, and so does Foster, in Captain Cook's Second Journey. Dr. Emerson, in Beard's " Neurasthenia," gives an account of the massage of the Sandwich Islanders, and finally we learn from an interesting series of articles in the " Gazette des Hopitaux," 1839, that, in the Tonga Islands, its manipulations are divided into Mili = effleurage and frictions; Fota = Pétrissage; and Toogi-toogi = tapotement. It is to be regretted that the French in this matter of the division of massage manipulations have not followed the classification of the excellent Tonga Islanders, which is much more rational than their own, or at least that which is given in Estradère's book.

out of a lucky cure, which the discriminating public pronounces an extraordinary achievement, though a physician under similar circumstances would "only be doing his duty." Let us admit that the gymnast often has had a special, though meagre training for his work,* and also that he belongs, in contrast with the quack doctor, to the better educated classes. In Sweden there is no lack of such people. The energetic young man who has recently entered the army, and has during much of the day nothing else to do but lug his sabre about the streets, which brings him much glory but little cash, soon tires of the former, and is often compelled by circumstances to bestir himself for means to increase the latter. He lightly turns to the Central Gymnastic Institute, a most excellent institute of its kind, "*quam honoris causa nomino*," where numbers of his comrades, obedient to orders, gather knowledge sufficient to satisfy themselves (and that often to an astonishing degree). Occasionally some one who has chosen the more difficult academic path to the Æsculapian temple, which to the young student in Sweden looms in the far distance, finds himself weakening after he has passed a few of the first milestones, and turns aside into this easier and more refreshing by-path. Muscular young women, who, for one reason or another, see no immediate prospect of entering upon more suitable duties, decide, for the time being, to improve their own condition and possibly that of others, by means of gymnastics and massage.

So far as the gymnasts confine themselves to the field in which by their training they belong, *i. e.*, the purely mechanical, and resort to physicians in individual cases for diagnosis, indications of treatment, etc., nothing but good is to be predicated of their practice. If it were suddenly to cease great loss would doubtless ensue, wherever it has become general. The mechanical work involved in mechano-therapy must needs, to some degree, always be performed by persons without a scientific training. The physician will often be reluctant to undertake such work. He may not have the needful bodily strength; or, being inclined to pursuits more purely intellectual, he will be likely to consider the labor monotonous and tiresome, and of such a nature that in many cases it can be very well performed by a less intelligent, and therefore less expensive human machine.

The independent practice of mechano-therapy by unscientific persons is, therefore, more harmful than helpful, not only as regards gymnastics, but much more even as regards massage. Like every other branch of activity whose principles are not all complied with it must be inferior. Although mistakes due to ignorance, as has been said, are less fatal, for obvious reasons, than in the practice of internal medicine, still it happens rather frequently that mischief is done, and still oftener that the treatment proves inefficacious. This mechanical quackery has injured mechano-therapy very much, both with the public and with physicians. The confidence of the more thoughtful section of the public is not easily gained for a method of treatment which seems not to presuppose any study or knowledge worth mentioning, and is often without effect. The physician who is still unfortunately often averse to mechano-therapy, is prejudiced against it for the reasons given above, and the acquaintance he makes

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* Since the above was written (in 1886), an ordinance has been promulgated in Sweden, which forbids the practice of mechano-therapy on the part of non-physicians, who have not taken the course at the "Gymnastic Central Institute." As soon as the large number of completely uneducated gymnasts who lack even the meagre training involved in such a course—with whose practice the authorities are loth to interfere—shall have died off, mechano-therapy will stand much better in Sweden than formerly, so far as the degree of education possessed by its practitioners is concerned.

with its professional representatives tends to increase his distrust in the highest degree. The profession of gymnast entails certain dangers for the unscientific practitioner to which he is only too apt to succumb. The less nature bestows on him of talent to supply his lack of knowledge, the greater is his danger of falling into extreme one-sidedness. It also happens that the method of treatment which he employs, and whose effects he partially understands, becomes his all in all, and the forms of treatment that he cannot make use of are as nothing to him. He is highly elated over a few successful cases, and it is rare that one working in mechano-therapy has not some such; his ignorance gives free rein to his fancy, and although (or rather just because) he knows scarcely more of most diseases than their names, he thinks he can cure them all by means of massage or gymnastics, or by the two in combination. As he daily assumes to treat ailments of whose true nature he has hardly a suspicion, and soon marks the susceptibility of the public to little tricks of skill, it is not long before he seeks to conceal his ignorance by humbug of a more or less systematized kind, which is none the less apparent to the really discriminating because he parades the high sounding but cheaply acquired title of "Director" or "Professor." Thus a class is formed which, while it may not call for much attention, is peculiarly obnoxious to the physician. When the latter witnesses the ridiculous conduct of such a gymnast, notes his absurd statements regarding his art, his arrogance, childish enthusiasm, inflated dignity and crass ignorance, he is filled with contempt and is easily inclined to expend on mechano-therapy something of his feeling toward those who represent it. It is only human to question and doubt concerning an art which is represented in such ways.

It must also be admitted that the unsatisfactory standing of mechano-therapy is partly the fault of us physicians. Hitherto the world of scientific medicine has neglected this form of treatment, the practice of which is always more troublesome than writing prescriptions, and almost always less remunerative. Very many physicians are still so ignorant of mechano-therapy that they are alike unable to undertake it or to teach it to others. Finally, there is a class of men in our profession affected with what I should call intellectual snobbery, who will, on general principles, have nothing to do with a method of treatment that calls for mechanical labor.

These indifferent physicians have inflicted very nearly as much injury upon mechano-therapy as the numerous guild of charlatans mentioned above, and both together are responsible for the comparatively low standing of mechano-therapy and for the fact that in many countries there is a certain distrust not only of the method itself but also of its practitioners, since it is customary to consider skill in mechano-therapy as tantamount to ignorance in other branches of medicine.

We must *everywhere* come to the point of providing instruction in mechano-therapy in our medical schools, and of exacting the same guarantees for the physician's knowledge in this as in the other branches of medicine. Not until the physicians themselves, *in corpore*, adopt massage, will it be found practicable for the public to secure as good treatment in mechano-therapy as in all other forms of treatment; and not till then shall we be able to exercise control over the work of others and to attack vigorously and uproot the ignorant, impudent, and dangerous practices which we denounce so often, and for whose existence we are ourselves largely to blame. In every country there are numbers of young physicians who have possibly too much opportunity to practice massage, who might, moreover, find in this energetic form of therapeutics a grateful diversion from the often thankless procedures of internal medicine.

Then shall the number of physicians who devote themselves exclusively to mechano-therapy and especially to massage, be diminished or entirely abolished,

which would be a further advantage, in my opinion. Exclusive devotion *to this form of treatment* is not favorable to the development or maintenance of the attributes which should distinguish a physician.

Massage is an easy *handicraft* which does not demand long continued study, but it has points of contact with general medicine, in which he only can become skillful who maintains the character of a general practitioner. The medical knowledge and skill of one who is only a masseur, suffers from the one-sidedness of his practice, and he soon tires of it; besides, I am convinced that generally the best masseur is he for whom massage is but a change of work.

CHAPTER II.

THE TECHNIQUE OF MASSAGE.

The technique of massage is a matter of peculiar importance, since its effect naturally depends on the manner in which it is executed. But massage is an easy art, requiring less practice and skill than many other mechanical procedures which recur frequently in our calling, in which we all demand a certain amount of dexterity of ourselves—as, for instance, in using the laryngoscope or the catheter, the performance of ordinary surgical operations, etc. The various manipulations and their modifications naturally suggest themselves to one who clearly comprehends the anatomical, physiological, and pathological indications in any given case. Just here lies the great difference between a scientifically trained and an untrained masseur. The former has, during his course of medical study, traversed most of the way toward becoming a good masseur: there is demanded for what remains, a relatively short course of study, normal upper extremities, that are not too weak—the hands especially should not be too lean or small—and some aptness for mechanical work. It is an advantage to work with or under an expert masseur, for a time, the technique being more speedily and readily acquired in this way than in any other. Besides, one more quickly acquires certain forms of dexterity, peculiar to the masseur, which could, otherwise, be gained only through long continued, independent practice. I would, likewise, emphasize the fact that it is not well to follow a particular mode of technique too slavishly, but that every one should work out his own technique, which soon becomes as characteristic as his own handwriting. It is clear that manipulations, which have entirely the same effect upon the patient, may be quite variously executed by the masseur. A good masseur never thinks, while at work, of the way he uses his hands, but only of the tissues he is manipulating; and the quality of his massage depends, for the most part, upon his knowledge of their condition.

To such knowledge belongs, in addition to the sciences men-

tioned, ability to make accurate palpation; skill in this respect is the masseur's most difficult acquirement, and is only to be gained and maintained through practice. (The character of the examination which a masseur should make will be set forth further on.)

Massage usually is best given with the hand. A variety of instruments have been devised, however; most of them are intended for "tapotement," (see below). Of such, we may mention the modern imitations of ancient models,* known as massage-hammers, or percussors, which are either similar to the percussion-hammer, or consist of a handle bearing a metal stock, which carries a rubber ball at its end. Another of the same sort resembles a thimble, having a solid ball of rubber set into its top.

Besides these there are others, the so-called "Muscle-beaters," consisting of a handle with one or more rods of solid rubber (Klemm's "Muscle-beater," Klemm's "Little-fist"). Dr. Granville, an English physician, has devised a percussor run by clock-work, and an electric percussor; hammers as well as brushes can be used with the latter. For other manipulations, a few masseurs make use of several different instruments. One class of these consists essentially of wheels, of wood or rubber ("Roller"—"roulette"), which in varying numbers are arranged in a row upon an axle (Heinrich, Mager). Similar contrivances provided with a metallic wheel have been used for applying electricity at the same time with massage (Butler, Stein). Some combine mechanical and electrical treatment by giving massage with reophore-sponges, especially

* I have not been able to share fully M. Estradère's strongly marked admiration for M. Estradère's book upon massage. But it contains some pages of great worth, in so far, at least, as they show the absurdity into which disputes as to priority, which are so frequent now-a-days, may degenerate. The ancients performed tapotement with a "palette," a shaft with a broad plate of wood at one end. For the latter a bladder of some animal was frequently substituted. A French gentleman, M. Sarlandière, instead of this, put a rubber ball on the end of a little stick, and named the whole thing a "battoir," and belabored his patients therewith, in itself a very innocent procedure, which he dignified by the name of "massage à percussion de Sarlandière," thereby seducing the learned but unsuspicious Messieurs Trousseau and Pidou to employ the same neat epithet in their "Traité de matière médicale et thérapeutique." This grievously vexed M. Estradère, who devotes much eloquence, and several pages of his book, to showing how unjust it is that all these marks of esteem should be shown to M. Sarlandière. In order to contribute my mite toward reassuring M. Estradère, and to make up for my indelicate utterances concerning his book, I will solemnly acknowledge that M. Sarlandière cannot rightfully win any glory, either with his little stick or the rubber ball of his "battoir."

adapted to the purpose. In order to excite the skin powerfully when giving effleurage, straps, brushes, woollen gloves, sponges, etc., have been employed. Finally, a Swedish physician, Dr. Zander, has attempted to give massage by means of his ingenious steam-driven machines, most of which, however, are intended for gymnastic purposes.*

All of these inventions are more or less happy attempts to supersede or supplement the hand, which is the best instrument, after all. With it one can perform all necessary manipulations, without exception. Most masseurs use only the hand.

The manipulations employed in massage have been classified in a variety of ways. The Mezger school, and a considerable number of German masseurs, arrange them in four classes,† which are designated by the French terms—(1) *effleurage* = stroking, (2) *frictions* = rubbing, (3) *pétrissage* = squeezing, and (4) *tapotement* = striking.

Effleurage (see Fig. 1) consists of centripetal‡ strokings, made with varying degrees of pressure, usually over a considerable surface of the skin, and frequently over the larger veins, with the flat of the hand, its ulnar or radial edge, with the *thenar pollicis*,

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*Dr. Zander, on account of his use of steam-power in mechano-therapy, has aroused antagonism in certain quarters, which reminds us of similar utterances, due to injured interest, when steam-power was introduced in the place of hand-power. This ingenious man, despite his sincere and honorable character, and his extensive medical knowledge, has been subjected to ruthless attacks on the part of persons who had no knowledge of him or his apparatus. This apparatus is, for the most part, intended for the passive and duplex movements of gymnastics, and according to the well-nigh unanimous judgment of experts, answers its purpose most admirably. This latter statement, for reasons that are readily seen, does not apply so fully to the small number of Zander machines designed for massage; but their inventor has never attributed to them any special importance in this regard. *Manual* massage-sittings are given in the Zander Institute, in Stockholm, to the number of more than two thousand yearly. Although Dr. Zander has chanced to be misunderstood by one and another mechano-therapeutist, he has also had the inestimable good fortune to find a highly gifted and rarely disinterested promoter of his method in Dr. Nebel, to whose efforts the present wide recognition of the same is largely due.

†This is surely the most rational and the simplest classification, and no massage manipulation can be conceived that cannot be assigned to one of these four classes, which are distinguishable from one another, partly through their peculiar character and partly by means of their different ends. Naturally, there are numberless transitional forms of manipulation, especially in the case of effleurage and frictions, which, as will be shown below, have different purposes in their typical forms. To multiply subdivisions here, is only to make a plain and simple thing involved and forbidding. To add a division of "passive movements," is to invade the domain of gymnastics.

‡Centrifugal effleurage, *i. e.*, effleurage made in a direction contrary to that of the venous blood-stream, which is prescribed by certain authors, is, I hold, *never* called for.

with the base of the hand, with the thumb and forefinger; oftenest with one hand at a time, but sometimes with both hands simultaneously, *e.g.*, when one completely encircles an extremity. Effleurage is a form of massage which is employed with extreme frequency and meets a therapeutic end which continually recurs in practice. The most prominent office of effleurage is to accelerate the circulation in the blood and lymph-vessels.*

FIG. 1.

EFFLEURAGE.

Frictions (see Fig. 2) are rubbings which are most frequently made with the volar side of the thumb or with the last phalanx of the middle three fingers. The masseur's finger tips move in small circles over a small area, often exerting considerable pressure, but the direction in which the frictions are made is a matter of minor importance. Frictions are chiefly employed

* In order to give the reader an idea, at the very outset, of the essentially unlike purposes of the different manipulations, I will note briefly, right here, the effects which *preferably* belong to each of these classes—although it involves something of repetition in the chapter on the physiological and general therapeutical effects of massage—where I treat the matter in fuller detail.

when they serve to promote the regressive metamorphosis of exudations and infiltrations and to press the refuse so arising into the most external lymph-canals.

Pétrissage (see Fig. 3) is usually performed by grasping a part of the tissues to be acted upon between the thumb on one side and the other fingers on the other side, and, while the fingers of the two hands are brought very near each other, making a series of pinchings or kneadings. The tissues during pétrissage are fre-

FIG. 2.

FRICTION.

quently lifted somewhat out of their ordinary position. In operating on larger masses of tissues one may use the two hands, open or shut, one upon either side of the encompassed part, so that, as for instance in pétrissage of the calf of the leg, one hand of the masseur shall be entirely on the outer and the other entirely on the inner side of the same. Pétrissage is commonly performed on muscles whenever they are readily accessible for such a manipulation, *e.g.*, the flexors of the extremities or the upper edge of the cucullaris muscle, which is extremely often

the seat of so-called muscular inflammation and the infiltrations due to it. Pétrissage involves a good deal of exertion on the part of the masseur, and calls for a great amount of practice. One becomes wonted, through practice, after a while, to use only the necessary amount of force to make the hands keep time with each other, and to execute a great number of squeezes in a short time. The action of pétrissage is the same as that of frictions. Furthermore, it possesses in some degree the same qualities as tapotement, and like it, acts as a mechanical stimu-

FIG. 3.

PÉTRISSAGE.

lation of the muscles, which on being pinched, contract just as they would if subjected to a blow.

Tapotement (see Fig. 4) consists of blows, raps or choppings, which are given by the flat of the hand, by its ulnar edge, by the tips of one or more fingers, by the volar or dorsal surface of the fingers when spread apart, or by the edge of the fist. Tapotement is a particularly powerful means of mechanical excitation. It is performed in different ways, according to the different organs to be operated on. The skin and peripheral nerve-endings are best

treated by blows with the flat of the hand; the nerve-trunks by the finger-tips, used like the percussion-hammer in physical examinations; and the muscles by choppings made with the ulnar side of the hands, which are held perpendicularly to the long axis of the muscles.

This classification of the manipulations, under four categories, is based upon the physiological effects of the different manipulations. To recapitulate; we employ effleurage = stroking, to accelerate the local circulation; frictions = rubbing, to

FIG. 4.

TAPOTEMENT.

further regressive metamorphosis; pétrissage = pinching, or squeezing, for the purpose last mentioned and for mechanical irritation of the muscles; and tapotement = striking, for the mechanical irritation of muscles and nerves. This is all very clear, but a little clearer on paper than in nature. As every manipulation has more than one physiological effect, so every physiological effect can be brought about by manipulations of more than one kind, which merge into one another through intermediate forms. If we consider the relations between the

three elementary manipulations, effleurage, frictions and tapotement, it is evident that manipulations can be performed which partake of the character of the first and second class, and that other manipulations may partake of the characters of the second and third. A friction made centripetally over a large surface of the skin is effleurage, and has the effects of the two sorts of manipulation mentioned. If one rubs the skin of the forehead across the line of the supra-orbital nerves, the manipulation resembles and acts like a friction; but it also irritates the nerves as tapotement would do, and may be performed in a manner more or less closely resembling the latter class of manipulations. It is of little importance what you call such a manipulation (you may call it a "nerve vibration," if you please), provided you understand its distinctive action (see Index).

In France a different classification of manipulations is in use, which is, moreover, extensively subdivided. The following scheme, according to Estradère, is presented here, chiefly as a curiosity:—

- 1. Frictions.
  - Humides Seulement, ... Onctions.
  - Sèches ou humides.
    - Douces.
      - Passes.
      - Frôlements.
      - Attouchements.
    - Moyennes ou rudes. — Frictions.
- 2. Pressions.
  - Sèches ou humides.
    - Douces.
      - Agacements.
      - Chatouillements.
      - Titillations.
      - Taxis.
    - Fortes.
      - Pétrissage.
      - Malaxation.
      - Froissement.
      - Pincement.
      - Foulage.
      - Sciage.
- 3. Percussions.
  - Sèches ou humides.
    - Douces or fortes.
      - Hachure.
      - Claquement.
      - Vibrations.
        - pointées.
        - profondes.
      - Percussion
        - poing fermé.
        - la palette.
        - flagellation.
      - propement
      - dite avec le

Estradère makes a fourth division which includes the following movements belonging to gymnastics:—

4. Mouvements.

- passifs.
- doubles.
- concentriques.
- et excentriques.

- Flexion.
- Extension.
- Abduction.
- Adduction.
- Pronation.
- Supination.
- Rotation.
- Circumduction.
- Tractions.
- Torsions.
- Secousses.

I consider this table to be too complicated and not very rational. The French are scarcely satisfied with this analysis either. They please themselves with still further phrases, and discriminate between "frictions rectilignes, anguleuses, spirales," and also "frictions en courbes, excentriques et concentriques." The last named peculiar (though wholly elegant) concentric and eccentric manipulations are performed by making frictions in continually widening circles about a given point, and then contracting such circles till the point of starting is again reached. These and similar artistic procedures rest on no anatomical or physiological basis whatever.

The degree of force employed in making manipulations is of the utmost importance, of course. It varies much, according to the therapeutical indications and the pathologico-anatomical conditions of each case. If, for instance, one has to do with a fresh sprain, looking chiefly to massage as an antiphlogistic measure, then he must use very light effleurage at first, especially at the beginning of each sitting. (If the case is one of extensive, tense œdema, with "plastic" tendencies, the effleurage and frictions are to be made more vigorously). Is it a question of removing the partially organized exudation products from the neighborhood of a joint, resulting from a fibrinous joint-inflammation; then we must apply frictions "without gloves." If an exudation be due to perityphlitis or parametritis, we must always bear in mind the proximity of the peritoneum, and the danger of starting a new inflammation. We shall speak more at length upon all these matters further on, which must, moreover, in individual cases be left to the judgment of the masseur. The commonest fault with beginners in massage is, to employ too much force: professional masseurs, on the other hand, often go to the other extreme. * I wish especially to emphasize the in-

* Very busy masseurs are constantly inclined to make their sittings both shorter and less energetic than the patient's interest demands, a procedure based on an extremely simple calculation which we leave to the reader to make, and the result is that they obtain quick results only when they are viewed from an economical standpoint. Some

correctness of the statement which some writers make, viz, that massage should never be so energetic as to cause sugillations or discolorations of the skin, and that every spot of that sort is a reproach to the masseur. Their statements may hold good with regard to general massage, so called, and in many other cases; but a multitude of massage-cases require such forceful manipulations that such spots necessarily must show themselves; they are, however, of minor importance and quickly disappear.

The length of the massage-sitting is, likewise, a matter of great importance; but no absolute rules can be laid down concerning it. Various factors enter into a determination of the *quantum satis;* the nature of the massage-affection being a matter of prime importance. In this respect, as in respect to the energy of manipulation, one must accommodate himself to the general condition of the patient. Nervous and sensitive patients are equally incapable of enduring long sittings or energetic manipulations. In such cases, treatment should begin with short sittings and gentle measures, which may be gradually prolonged and augmented. Local massage lasts, properly, about one quarter of an hour. General massage (which had best be given by some one who is not a physician), lasts at least half an hour, usually longer. In certain acute cases, especially when it is desirable to secure an "antiphlogistic" effect (through effleurage), as in case of a fresh *distorsio pedis*, massage must be given several times daily; at other times twice, and never less than once a day.

The masseur should accustom himself, from the first, to use both hands, and to divide the work pretty evenly between them. While still a tyro, he will, like a beginner in swimming, waste his strength and easily become tired; but he soon learns to secure the greatest possible effect of his manipulations and to do much more work than seemed possible at first.

The masseur should never, or only very exceptionally, (see

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persons who are exclusively occupied with massage, in their zeal to "complete" this art which is so simple in its technique, and to make it as imposing as possible, waste their strength on absurd subtleties. One author mentions a case of neuritis in which he had to make such light strokings that it seemed to him as if he were massaging the air—"I will call it *air* massage without more ado," he says; a proposal that I gladly agree to, as the name suggests my opinion of the therapeutical value of such a manipulation. Another gentleman goes still further and talks about a "moral" massage, which he does not further describe, but which he declares to be "spiritual, physiological(??), sympathetic and intellectual."

Dr. Bum's case of joint-neurosis below), employ narcotics in order to diminish or prevent the pain which he frequently must cause. On the one hand, such pains are seldom, if ever, very severe; on the other, there are no wholly unobjectionable means of counteracting them. Hypnotism and hypnotic suggestion have latterly begun to play a part in this connection, in certain cases, with wonderful results, it is said; but, for me at least, it is too soon to express a definite opinion about it. I prefer to maintain an expectant attitude toward hypnosis, for a few years yet.

Massage should always be performed immediately on the skin; as one loses precision of technique if he gives massage, as in certain cases many do, through the underclothing. Regard for the feeling of modesty may, in the physician's office, be so overdone as to imperil weightier interests or even to produce the very inconvenience it is intended to avoid.

Most masseurs—all Germans and Scandinavians that I have seen—employ some substance to render the skin soft and smooth. This is often necessary, especially where vigorous effleurage is called for, as otherwise pain would be caused through traction on the hairs of the skin, through irritation of the skin-glands, and finally by producing furunculosis due to such effects. Various substances are used for lubricating the skin, such as glycerine, vaseline, lanolin, lard, and olive oil. Glycerine I reject altogether, since by reason of its hygroscopic qualities it has a very irritating effect upon the skin. Vaseline is also somewhat irritating, and olive oil is unpleasant to manage. On the whole, I have found hog's lard preferable. It is generally used by masseurs of the Mezger school.

Where vigorous effleurage is used, especially on the forearm and lower leg, it may be necessary to shave the skin once a week.

The entire necessary outfit of a masseur, besides the above-mentioned lubricant, consists of a padded bench or sofa, which should be sufficiently long and broad, about sixty centimeters high, and accessible from all sides. It should have an adjustable head-piece, which may be fixed at any desired angle. When massage is to be performed on any part of the back, buttocks, chest, stomach, abdomen, or the leg, and to some extent the shoulder-joint, the patient should lie down upon the bench, and

the masseur stand or sit near it. In massage of the forearm, including the elbow-joint, patient and masseur sit opposite each other, each on his own side of the bench, upon which the patient lays his forearm. In throat and neck-massage, the patient sits upon the bench and the masseur stands before him in the first case, behind him in the latter, and so on. The proper position of the patient, in most cases, is self-evident. I shall refer more explicitly in the special sections of this work to those instances in which this is not the case.

Obviously there will be many different forms of massage, based on the anatomical relations of the parts concerned. Massage is generally *local*, and has to do with a small portion of the body only; but it can involve the larger part of the same, and is then termed *general*.

In what follows, the various forms of local-massage will be described in their proper places. From practical considerations and in order to facilitate the reader's study of the physiological and general therapeutical effects, which are explained in the next chapter, we will here give a brief account of the technique of the so-called general-massage, and of throat and abdominal massage as well.

General-Massage,* in which the patient should lie in bed, begins with the lower extremities and proceeds from the periphery toward the central parts. The masseur grasps one foot with both hands, and treats it with pétrissage and frictions, care being taken to press with the thumbs into the depressions between the bones. He then passes to the lower leg, gives effleurage, and long-drawn frictions, kneads and strikes the different groups of muscles, and finishes the massage of the lower leg with more effleurage. The thigh is treated after a similar fashion, that calls for no particular explanation. When both the lower extremities have been thus treated, the same course of procedure is repeated with the upper extremities. Gymnastics are frequently introduced into the treatment, and passive movements made upon the different joints in the

* General-massage has been employed for hygienic purposes, especially in connection with the bath, since immemorial times, among almost all Oriental and some European races; and still exists as a widespread branch of Folk-medicine, for instance, among the islands of the Pacific Ocean. It is used in medical practice, with great advantage, as a substitute for bodily exercise for persons who, for one reason or another, which does not contra-indicate massage, are prevented from taking active exercise. It constitutes a very important part of the so-called Weir Mitchell treatment.

order one comes to them as the sitting proceeds. One passes next to the massage of the back, making use of effleurage, frictions, tapotement, and renewed effleurage. After that the chest-musculature (in men), is treated in the same way; or one passes immediately to the massage of the abdomen, as it is described below. Abdominal massage, unless there be special contra-indications, should always be included in such a sitting. Finally, one may, if he will, bring the sitting to an end with throat-massage, of which a description is given below. Usually the head is let alone.

In general-massage, the manipulations are performed, usually, with moderate force; still it is often allowable to employ vigorous tapotement of the muscles. When effleurage and frictions are given to a particular part for a short time only and with little force, then it is unnecessary to make use of the lubricant, usual in many forms of local massage.

General-massage frequently lasts for an hour or more; it demands hardly more than purely mechanical skill, and may be given, in most cases, quite well enough by a person without medical training. It is well for the physician to put the patient into the charge of a person of the same sex as the latter, and to give his instructions, once for all, to the person selected as masseur for a given case.

Throat-Massage,* κατ' ἐξοχήν, or better, throat-effleurage, has for its aim the quickening of the circulation within the adjacent vascular areas, and consists wholly of effleurage. I append, in somewhat "concentrated form," Gerst's description of its technical features: The patient, having half of his chest unclothed, is told to stand up or to sit upright on the massage-bench, to bend his head somewhat backward, his shoulders being relaxed, and to breathe quietly, deeply, and regularly. The masseur, standing in front of him, lays his hands, with the palms turned upward, in the right and left grooves of the throat, in such wise that the tips of the little and ring-fingers rest upon the mastoid processes, and the ulnar sides of the lower parts of the hands lie along the edges of the lower jaw. Strokings are then made on both sides, in such a

* In Sweden throat-massage has been in use since the time, at least, of Ling, who described it and knew its principal effects. Gerst, Weiss, and others in our day, have emphasized its therapeutic value in various inflammatory processes and hyperæmic conditions of the head (see below).

way that the hand, while its ulnar side moves downward as far as the middle of the throat, revolves around its long axis so that its radial edge turns upward and inward toward the head, and finally comes in contact with the place where the ulnar edge rested at the outset. In this way the entire palm is brought into contact with the throat and is employed in the downward stroking: as the thenar eminences pass downward on both sides, over the common jugular veins, and the other parts of the palmar surface exert pressure upon the other veins. In the supra-clavicular fossa, the hand makes another turn around its long axis, and the radial edge of the hand makes the stroking. Pressure on the hyoid bone and the larynx must be avoided."

When it is necessary, Gerst allows the patient to massage his own throat, using the hands alternately, so that the thumb placed on the side of the throat (corresponding to itself) passes over the common jugular and the other fingers of the same hand act upon the other veins of the opposite side of the throat.

Weiss employs a method, chiefly in children's cases, which consists of strokings given by the thumbs exclusively, while the other fingers clasp the neck of the child, whose head is held in a reclining posture by an attendant.

Höffinger makes a practice of giving throat-massage while standing *behind* the patient, making effleurage with the palmar surface of the last and next to the last phalanges of the fingers in a manner so obvious as to need no further description.

In throat-massage the strokings are repeated continuously for about ten minutes at each sitting; in acute cases several sittings a day, even five or six, are called for.

It is of advantage to use a lubricant for the skin in these sittings. Throat-massage is best given by a physician, though it may be entrusted to another, as appears from Gerst's example.

Abdominal-Massage (see Fig. 5).—Finally I will describe here the "belly-kneading" or abdominal-massage,* which has become so common and is chiefly employed in cases of habitual constipation, or of dilatation of the stomach.

In abdominal-massage, the patient, with the abdomen uncovered,

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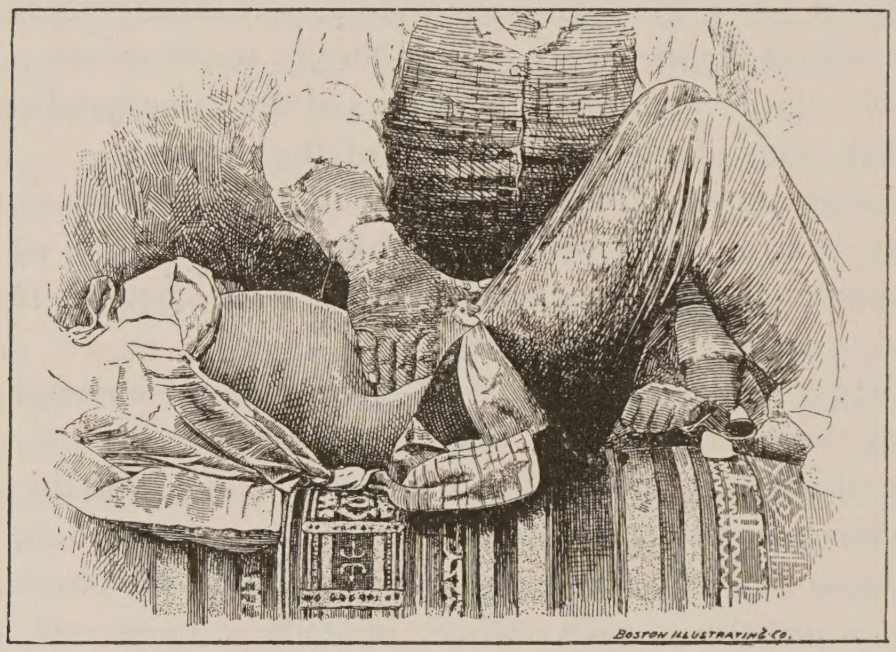
* Abdominal-massage has been used as a Folk-remedy, time out of mind; particularly among the Asiatic races, as well as among the Hungarians and Finns. Ling introduced it into his Sjuk-gymnastik = medical-gymnastics, and it is now employed by nearly all masseurs, at least in the north of Europe.

takes a reclining position on a massage-bench with his head slightly raised and his legs bent; and is admonished to breathe freely and not to tense the muscles of his abdomen. He will scarcely be able to do the latter at the first sitting, but after a little time he will succeed in doing so easily.

The manipulations which are made for the purpose of acting through the abdominal wall upon the intestinal canal, are thus performed. The masseur places the tips of his middle three fingers, which are held close together, upon the exact spot which he wishes to massage; he presses lightly upon the abdominal wall and executes small circular movements similar to those made

FIG. 5.



ABDOMINAL MASSAGE.

in frictions, whereby the patient's skin follows the excursions of his fingers. By executing these movements in a more vigorous and jerky manner one can exert, better than by uniform pressure, a powerful mechanical excitation, especially on the smooth-muscle fibres (*e. g.* in an atonic or dilated stomach), and call forth their contraction, as is done in the case of skeletal muscles by means of tapotement.

In massage of the stomach, these manipulations are to be made in the gastric and left hypochondriac regions; though, when the underlying organs are approximately normal in size, only a comparatively small part of them is accessible. But in

proportion as it is enlarged and extends below the limits named, the stomach becomes more accessible for massage.

When the large intestine is to be massaged, one begins at the cæcum, follows the ascending, transverse, and descending sections of the colon, and the sigmoid flexure till he comes to a point above the symphysis pubis, operating, meanwhile, on every square centimetre of the intestine, excepting so much as for anatomical reasons, cannot be reached, viz. the *Flexura coli dextra, et sinistra.* One uses but one hand at a time, though he continually alternates with the right and left.

The small intestine may be reached by similar procedures in the umbilical and lumbar regions.

The efficacy of the treatment depends essentially upon the thorough manipulation of a given part of the intestine, before the operator removes his fingers to the next section. I am convinced, by a very large experience, that the only manipulations really worth considering in this connection, are the simple manipulations here described, and that they are better than all others for securing the wished for result.

There are many other forms of manipulation in use which are divisible into several classes, such as: circular strokings around the navel, pressure upon the sympathetic nerve centres, blows upon the sacrum, etc., etc. I believe that some of them have never had their action clearly explained and are probably entirely without value, and that others are completely irrational—mere empty "decorations." Stroking over the large intestine (in which, for the sake of increasing the force of the procedure, one may place one hand over the other, and, beginning with the cæcum, follow the whole course of the colon, so far as it is accessible), has no essential effect other than to empty the contents of the intestines into the rectum, whereby no doubt peristalsis is more quickly aroused. But this is not the peculiar aim of the treatment, and, besides, one can bring about the same effect by means of the procedure which is described and recommended above. Wherefore, we may dispense with such strokings. No lubricant of the skin is needed in abdominal massage, when the manipulations are confined to the frictions named; on the contrary, where strokings are used, it is desirable to employ a lubricant.

Usually there is no need for the physician himself to perform abdominal-kneading, nor is any danger involved in entrusting it to others, though its efficacy is likely to be diminished thereby. For the rest, I refer the reader to the close of the next chapter, and also to the medical part of this work.

CHAPTER III.

THE PHYSIOLOGICAL AND GENERAL THERAPEUTICAL EFFECTS OF MASSAGE.

In setting forth the physiological and general therapeutical effects of massage, it is proper to discuss each class of manipulations separately, to a certain extent.

Effleurage quickens the circulation in the blood and lymph vessels, both in the part which is manipulated and in the parts adjacent to it. It is clear to all, that strokings in a centripetal direction, as they proceed over the skin, must exert pressure upon the underlying veins and drive their contents toward the more central parts. That these strokings are made in a direction opposite to that of the arterial stream does not detract in any degree worth mentioning from the effect attributed to them above, for the reason that the position of the arteries is deeper and more protected, and because their walls are so much more resistant. On the contrary, the arterial stream is quickened through the faster outflow from the veins and the diminution of the venous blood-pressure. This pressure becomes negative, immediately after the emptying of the veins and by reason of the elasticity of their walls, so that the blood from the neighboring venous channels is *sucked into* the veins which have been emptied, naturally with no very great force. Massage, therefore, promotes not only the circulation within the tissues that are operated upon, but also has a direct effect upon the circulation of the peripheral parts which lie next them; this, for example, is particularly the case in the so-called throat-massage, on account of the favoring anatomical relations existing in that case. The venous blood-stream, in the contiguous tissues, on the central side, is quickened likewise, the blood being pressed into them, as it were. In other words, massage, as Von Mosengeil aptly expresses it, acts simultaneously as a pressure- and suction-pump, a fact that is worth remembering in practice.

So much for the direct local effects of effleurage upon the circulation in the blood-vessels.*

That strokings cause an accelerated flow within the lymph-vessels has been determined experimentally by investigations made in Ludwig's laboratory, and been proved with especial success by Lassar. Here, too, all manipulations which bring pressure to bear upon the tissues are effective, though to a less degree than centripetal strokings; since the lymph-vessels are, like the veins, provided with valves which permit a flow in a centripetal direction only.

The power of effleurage to hasten local circulation is an extremely important attribute, which constitutes the foundation of its great therapeutic worth.

The power of effleurage to counteract incipient inflammations rests partly upon this quality, and makes it, in certain cases, an excellent antiphlogistic. We may disregard, entirely, in this connection, the still debated question regarding the various phases of inflammation and the origin of inflammatory products, which have little bearing on our understanding of the nature of the effects of massage, and especially of effleurage. All are agreed that inflammation begins with the dilation of the small vessels (the corresponding arteries, capillaries, and veins), a slowing of the blood-stream, and stasis within the affected area; after which follows an accumulation of white blood corpuscles on the walls of the vessels; diapedesis, or their migration from the vessels into the tissues, and an increased profusion within the latter of fluid and cells. Effleurage, by its quickening of the circulation, which has been described, prevents stasis as well as the adhesion of the white corpuscles to the walls, and their subsequent migration; and for the same reason contributes to the deportation by the lymph-canals of the cells and lymph already taken up by the vessels. The effect of effleurage in this regard is often literally palpable, and masseurs, in order to demonstrate

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* The *reflex* influence of massage upon the action of the heart, the vessels, and the circulation as a whole, does not lie within the scope of our present discussion, and will be touched upon below. No *direct* influence, worth mentioning, upon the supply and filling of the heart with blood, upon the intra-cardial blood-pressure, and upon cardiac activity (through promotive effects of effleurage upon the circulation in any circumscribed peripheral vascular area) can be assumed to exist, in most cases. It is likely that throat-massage = throat-effleurage is the only form of local massage in which such an effect is conceivable; and even in this case it is probably so inconsiderable as to have no practical significance.

it in the most striking way possible, are wont to introduce a case of ordinary *distorsio pedis*, in which effleurage will in a short time produce a visible abatement of the symptoms of inflammation, the redness, swelling, and pain being speedily diminished and functional power restored.

The property of massage, of acting as a promoter of the circulation and as an antiphlogistic outside of the region subjected to massage, accounts for the use of the so-called *preliminary massage*. It is often customary, especially in acute cases, to begin the administration of massage with effleurage, which is made toward the central parts of the body, as regards the affected spot, in order to reduce in the latter the inflammatory tension and the pain due to pressure.

By increasing the circulation, effleurage, under ordinary circumstances, increases the temperature of the skin within and around the part massaged, which Mosengeil and Zabludowsky have demonstrated by thermometrical measurements.

The keenness of the temperature-sense is augmented immediately after effleurage, but soon sinks again. The acuteness of the pressure-sense is either increased or unchanged, or lowered, which Zabludowsky explains, probably correctly, thus: the augmentation is due to the livelier circulation; the diminution results from the mechanical irritation of the nerves of the skin, and these two factors strive with each other for the upper hand.

Through its ability to quicken the circulation, effleurage is also able to heighten the nutrition of the tissues within and around the area of its immediate influence; for, in spite of our still extremely incomplete knowledge of the details of nutrition, we do know for a certainty that the interchange of material, cellular vitality, etc., in the tissues depends in an essential degree upon blood-supply, therefore effleurage contributes, naturally not in a striking degree, unless it is long and frequently employed, toward counteracting local influences of an atrophic sort. For the same reason it is of great value, when the anatomical conditions are favorable, in promoting the process of healing, which, with its assistance, takes place quicker and more vigorously than would otherwise be the case. Effleurage is, therefore, a valuable procedure in many cases of traumatic injury, as well as in some cases of delayed healing due to disturbed circulation or to poor nutrition from some other cause. (See, for example, cases under *ulcus cruris*, and pseudarthrosis after fractures.) Finally, effleurage is able, hereby, to limit or prevent a threatened mortification or gangrene, in certain cases.

Furthermore, by reason of its ability to increase the circulation, effleurage possesses another peculiar attribute, which, though of less importance than others belonging to it, has, like them, been known from immemorial times, long before its meaning was guessed at; it has, namely, the property of removing fatigue, acting as a restorative to groups of tired muscles.* Fatigue, as we all know, results, partially at least, from the presence of the so-called fatigue-products (carbonic acid, lactic acid, acid phosphates, etc.), due to the consumption of oxygen and the lack of those substances that are oxidized during muscular contractions; and physiology teaches us that the removal of the fatigue-products, and the access of fresh blood, rich in oxygen and oxidizable substances, acts as a restorative on the working power of the muscle.

Zabludowsky has demonstrated the power of effleurage to overcome fatigue quickly. He caused a person to exhaust his arm muscles by making maximal flexion a certain number of times, at the elbow-joint, while raising a weight; he then gave the exhausted arm effleurage for five minutes, immediately after which it was found capable of performing even more muscular labor than before. Previously, the same arm, after the same amount of work, and having had no massage, was not able to regain its power of work through resting fifteen minutes. Zabludowsky has also shown that cramp may be more quickly removed from tired and convulsively-contracted muscles (in rabbits) by means of massage than through rest alone. Finally, Zabludowsky has proved that after massage, which did not augment the excitability of spinal cord centres, the same amount of stimulation called forth stronger reflex-contractions than it had before the massage was given, the augmented contractions being due to the increased working power of the muscles.

A musical director whom I know of, is in the habit of taking effleurage for a short time before the performance, whenever he has occasion to lead his orchestra, having found that after such treatment, he is not so easily fatigued by handling the baton.

In speaking of the antiphlogistic power of effleurage we touched upon its power to promote resorption of superfluous lymph and cells within the tissues, which process, as is well known, depends upon the circulation, so that the brisker the circulation the more rapid is the progress of the resorption. Effleurage also affords a capital means of bringing about the resorption and disappearance of all sorts of effusions within the tissues, in those cases in which the cause of the effusion is transitory. In recent hæmatomata or extravasations of lymph, as well as in more fortuitous œdemata, effleurage is most serviceable;

* It is not improbable that effleurage can influence nerve-weariness in an analogous way (just as it does, without doubt, affect the nutritional condition of the nerves). So far as I know, however, no investigations touching these points have been made.

and even in cases wherein the continuance of the primary disease insures a return of the œdema, it is of considerable value as a means of temporary relief.

It has been frequently demonstrated that massage is efficacious in promoting resorption from the serous cavities. Under favorable anatomical conditions, effleurage, which increases the out-going stream of blood and lymph, or any other manipulation upon the serous cavity whereby the pressure within it is raised, may prove efficacious. It is of equal practical importance in the treatment of effusion within joints and the sheaths of tendons.*

Von Mosengeil injected a solution of India ink into the knee-joints of a rabbit; massaged one of the joints so treated, but not the other; thereupon the swelling produced by the injection disappeared from the massaged joint, but remained in the joint which had not been massaged. On section the latter was found full of masses of ink, while the same were only found in the lymph-channels leading out of the massaged joint. Von Mosengeil's experiments have been repeated by Sturm and Sallis.

Reibmayr and Höffinger injected water into the abdominal cavity of rabbits. Certain animals thus treated were not massaged, while others were subjected to kneading of the abdomen for ten minutes during the first hour after the injection, and the abdomen was then opened. In the case of other rabbits, the belly was kneaded in the course of the first and second hours after the injection and then opened. For the sake of comparison the injected, though not massaged, animals were opened at the end of the first and second hour respectively. Examination showed that the resorption of water was notably greater in the animals that had been subjected to massage than in those that had not, but that this quicker absorption took place, entirely within the first hour. During the second hour less water was absorbed by the massaged animals than by the others. Naturally! Since there was then much less water left in the former and the pressure within the abdominal cavity consequently was diminished; by prolonging the massage during the second hour the result might possibly have been changed.

Reduced to tabular form the results of the experiment are as follows :—

TIME.	Amount of Absorption of Water Expressed in percentage of Body Weight.	
	Had Massage.	Had not Massage.
During the first hour, ...	4.57	9.09
During the second hour, ...	2.83	1.20
At the end of second hour, ...	7.40	10.29

* If a masseur will by massage mitigate ascites, which is always secondary (with very rare exceptions) to heart, lung, liver or kidney affections, and if the poor patient finds help therein, so that he can clutch at such a straw for a season, then —"*à chacun son goût.*" Massage of the other serous cavities does not deserve to be mentioned even.

The fact that massage, with the help of mobile pressure, has the power to promote regressive metamorphosis and the resorption of the products of inflammation, is of the most fundamental therapeutical importance.

We have in mind, here: infiltrations in and under the skin, in the muscles, tendons, joint-capsules, and ligaments (oftener, too, than one thinks, in the fascia), in the nerves and their sheaths; perityphlitic, peri-, and parametritic, and other exudations, as well as cellulitis of various kinds—in short, the chronic inflammations in their manifold forms (and to some extent, the products of acute* inflammation, too). All massage manipulations are, to some extent, efficacious in this class of cases, but, above all, frictions, which must be made with firm pressure, unless there be some especial reason to the contrary. Sometimes, the cellular elements, in the more or less organized products of inflammation, by such treatment are induced to undergo fatty metamorphosis and become disorganized with surprising rapidity; at other times, such results are reached only after long and assiduous labor. The minute particles are then, by the same manipulation, pressed forward into the external lymph-vessels, in order that they may be carried still further away by means of effleurage. Still another factor in the promotion of regressive metamorphosis may be adduced, namely: that newly formed capillaries, by means of which the heightened nutrition in the new tissue is maintained, may be crushed by means of firm frictions, which lead to an earlier destruction of the tissue. Finally, frictions, in the way above mentioned, also promote the resorption of inflammatory products, in that they spread them over a wide area as soon as they crumble to pieces, and so bring them into relation with a larger number of lymph channels.

Just as massage, and especially friction, is able to promote resorption of inflammatory products, just so can it contribute to the resorption of fat in fatty tissue. Therefore, vigorous general massage may well form part of the treatment for obesity, as in the Harvey, Banting, Voit, Ebstein, Demuth, or any other method which derives its name and standing from some particular writer. However, massage is not of very great value in such cases. Patients remain fairly "presentable" without it so long as they hold to a restricted diet and take exercise, but tend toward corpulency as soon as they give them up. Friction can also serve the purpose of destroying granulations of an unsatisfactory sort, and thus lead to the growth of healthier and better ones.

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*On the other hand, all purulent processes and abscesses lie completely outside the indications for massage (see p. 70), and although it has had advocates in this as in every other domain, so to speak, Messieurs the masseurs will doubtless do best, if, once for all, they leave this domain to the surgeons.

It has thus far been easy both to set forth and to comprehend the physiological effects of massage, and we have described the most important of them. I come now to a part of my subject which, though longer than the part so far discussed, is of less practical importance. Its exposition on account of our defective knowledge regarding various relevant details, must necessarily suffer somewhat from incompleteness and uncertainty. Meanwhile, I will, so far as I am able, endeavor to give an account of massage as a means of mechanical excitation, and of the influence it exerts upon muscles, nerves, vessels and, to a certain degree, upon cell-life and glandular activity also.

Obviously all the manipulations act as mechanical excitants. Still this is the peculiar office of tapotement, as has been mentioned already.

Tapotement of the muscles stands foremost among the manipulations which aim at mechanical excitation. A blow, as also pressure or a pinch, calls forth a local contraction which, as we know, is independent of any nervous stimulus, and exclusively so by reason of the independent irritability of the muscle itself. (Kölliker, Kühne, Schiff). This is a particularly effective way of stimulating a muscle, and can even be employed when the susceptibility of the muscle to other forms of stimuli, *e.g.* the electrical, has given out.* The contraction itself furnishes the conditions for a quicker access of blood and interchange of material, increase of temperature and nutritional activity. In practice, muscle-tapotement is a very important part of massage, and proves extremely serviceable in counteracting muscular atrophy and in restoring normal size and functional power to groups of thin and weak muscles. I shall return to this subject further on, when I come to treat of the affections of muscles, and to speak of the Weir Mitchell treatment for neurasthenics. During the rest in bed which is an important factor in the Weir Mitchell treatment, massage must be used as a substitute for daily exercise.

In the first place, massage acts as a mechanical irritant of the skin. Still, in the ordinary meaning of the term, massage is of little practical importance as a skin excitant. We have far better

* Erb states that the heightened susceptibility to mechanical stimuli of degenerated muscles usually appears somewhat later and disappears somewhat earlier than their increased galvanic irritability.

and more convenient means of increasing the general activity of the skin, in our various sorts of baths; nor is massage particularly serviceable in local stimulation of the skin. Besides its effects already set forth (see Chapter II,) upon the functions of the skin and its incidental and unexplained effects upon the cutaneous glands, massage exerts an influence of some importance upon the nerves of the skin. This brings us into a new, extensive and still misty field.

The mechanical stimulation of the nerves by massage is effected in one of two ways. Sometimes the nerve-endings in the skin are affected through the manipulations; and again, the nerve-trunks themselves are directly acted upon. This is best effected when the nerve-trunks lie superficially, with a hard bony surface underneath, as for example, the supraorbital nerve which is outside of the *Incisura seu foramen supraorbitale.*

In order to acquire as clear an idea as possible of the multifarious conditions which meet us here, it is needful for us to recall to mind the most essential occurrences which attend the stimulation of sensory, motor, secretory, and vaso-motor nerves. *

By repeated blows along the course of a sensory nerve-stem, the nerve is stimulated and its activity becomes modified in a manner whose details are unknown to us. No doubt the stimulus reacts upon the respective nerve centres in some other way than simply through sensory impressions. We are as unable to explain the way in which frictions, tapotement, and nerve-stretching † can bring about improvement or, occasionally, complete recovery, in pure neuralgias (without any palpable anatomical change), as we are to explain how the neuralgias themselves originate; but the fact, which is of practical importance, may be considered a fixed fact. Pressure on a sensory nerve, as we all know, causes a sensation which increases in proportion to the pressure, until the last named reaches a certain and always rather high degree, when the sensation ceases, sometimes temporarily, sometimes permanently. This is of practical value, as it is often possible in this way to cut short a neuralgia.

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* I leave trophic nerves, concerning which we know so little, out of our consideration.

† Nerve-stretching, by reason of its narrowing of the lumen of the Sheath of Schwann and the resulting pressure upon the medullary-sheath and the axis-cylinder, has the same influence upon the nerves as direct pressure (Ad. Zederbaum), which is of importance, for instance, in the treatment of sciatica.

We have analogous conditions in the case of motor nerve fibres. Here, too, the action of the nerve is modified through the mechanical irritation, and it is highly probable that a reaction upon the nervous centres is thereby caused; but it must be admitted that it does not yet appear what therapeutic use is to be made of this fact. Through light pressure the irritability of motor nerve fibres is augmented; through strong pressure it is diminished or abolished (Tigerstedt). A slow (not a regularly increasing) pressure upon the nerves causes the corresponding muscles or groups of muscles to contract, and thereby causes an effect which is many hundred-fold greater than the energy expended in the stimulation. It is of some interest to masseurs, that we can by pressing upon the phrenic nerve, where it is accessible in the neck, overcome cramp of the diaphragm, and can by static pressure upon other motor nerves put an end to cramp and tremor in their corresponding muscular areas (Wide). Wide has observed muscular contractions, due to mechanical stimulation of the nerves, after all susceptibility to both faradic and galvanic stimulation had disappeared; when the latter returned, the mechanical irritability remained permanently greater.

The influence which massage may exert through direct stimulation of secretory nerves upon the activity of the glands animated by them is of wholly subordinate importance, and is to be taken into account very rarely and only incidentally.

So, too, the reflex stimulation of sensory, motor and secretory nerves has either a subordinate or thus far inexplicable meaning for the masseur. He has sufficient opportunity, to be sure, in his practice, to observe examples of sensory reflexes; still he never has any rational ground for calling them forth, or motor reflexes either. Secretory reflexes may have a special significance in abdominal-massage, and we shall return to this point toward the end of this chapter.

The influence of massage upon the heart and blood-vessels, by means of direct or more frequently by reflex stimulation of the nerves which control them, remains to be considered. I take the liberty of introducing a brief recapitulation here, which, though it may be unnecessary for the majority of my readers, may not be altogether surperfluous for others of them.

Every one of us knows that the heart is influenced not only by (1) its own nervous centres, but it is also innervated by (2) fibres from the vagi, and (3) from the

sympathetic system; that the vagi * (independently of the fact that they contain fibres which exercise a contrary influence), are, on the whole, inhibitory nerves of the heart, that slow (Coats, Gaskell, Heidenhain) and weaken the heart's beats, and, through their direct or reflex stimulation, can cause the heart to stand still in diastole; that, on the other hand, the sympathetic nerves to the heart are accelerators, and may when stimulated make the heart-beats more frequent; that the vagi are more easily roused to reflex action, and react more quickly to stimulation than the sympathetic fibres, which latter show, however, a longer "after-effect," following the cessation of the stimulus.

We may not overlook, here, the innervation of the blood-vessels and certain allied facts, if we wish to make clear the working of massage; both its direct and reflex influence is of importance here.

It is scarcely necessary to recall the vaso-constrictor and vaso-dilator nerves. We all remember Bernard's renowned experiments (1851): the section of the sympathetic in the neck, in rabbits, and the resulting hyperæmia of the ear on the same side; also Brown-Sequard's discovery (1853), that stimulation of the peripheral stump of the nerve caused the vessels to contract again. We remember, too, that the discovery of the vaso-dilator nerves quickly followed. Bernard, in 1850, having observed that stimulation of the chorda-tympani caused a widening of the vessels and hyperæmia in the submaxillary gland; Vulpian by his investigations on the lingual and glosso-pharyngeal nerves, and Eckhard and Lovén by their observations upon the erigentes, increased our knowledge of the vaso-dilators. Since these various investigators have shown that constrictor and dilator fibres are of wide occurrence, oftentimes being found in the same nerve trunk, and that stimulation of these common trunks under different conditions, may cause one or the other set of fibres to react more prominently,—constrictor effects being, on the whole, the more pronounced—active hyperæmia may then arise either from paralysis (inhibition) of the vaso-constrictors or the excitation of the vaso-dilators. Hyperæmia of the latter sort lasts scarcely longer than the stimulation, though hyperæmia produced by inhibition may continue for a long time. On the contrary local anæmia cannot arise from paralysis of the dilators, section of which causes no constriction; in a word, the dilators have no "tonus."

Finally, we are reminded that the splanchnic nerves are the most powerful of the vaso-constrictors, since they control the voluminous streams in the mesenteric vessels, a diminution of whose calibre is of itself sufficient to increase the pressure of the blood in the heart and arteries, while their widening is equally efficient in bringing about a corresponding fall in blood-pressure; and that the splanchnics have a certain reciprocal action in relation to the other vaso-motor nerves, the latter being without power, generally, to exercise any considerable independent influence on the blood-pressure.

In all stimulation, its intensity and duration are of importance; a weak stimulation causes a constriction at first, while a prolonged or powerful stimulation results in a vascular dilation. Moreover, every one knows that we can excite an intense hyperæmia by a series of blows just as it is possible to prolong or

* I would point out that though we may by pressure upon the vagi in the neck cause slowing and even cessation of the heart's stroke, still it is by no means a harmless procedure; and its usefulness, under any circumstances whatever, remains to be proven.

render an inflammatory process "acute" by the same means. At times this fact may be of practical importance, since it is easier thus to cut short an active process of this nature than an entirely torpid one. Thus, for example, by using tapotement vigorously, together with other manipulations, in a very torpid case of *hydrops genu*, one may the more easily gain control over that frequently obstinate affection. In other cases of far less frequent occurrence, it may be an advantage to maintain or produce an inflammatory process for the sake of promoting the resorption of old exudations in some particular region, in precisely the same way that an old pannus may be cleared away by inoculating a blennorrhœa in an eye. Mezger made use of tapotement in just this way in Baron S.'s case of patellar fracture, which is described more fully below.*

Nor is the reflex excitation of the heart and vaso-motor nerves, by means of massage, lacking in significance. Still it behooves us to be cautious in expressing ourselves concerning our knowledge on this point. So far as the human subject is concerned, little more can be said than that massage, no matter how it is performed, produces reflex effects, both during and after its application, which effects are seen in the narrowing as well as in the widening of certain blood-vessels; in the rise as well as in the fall of arterial blood-pressure; in the quickening as well as in the slowing of the pulse. Still it is safe to say that the particular character of these effects is determined by the manner in which the massage is given, by the place at which it is applied, and the organs reached by it.

We here leave entirely out of account the numerous experiments made by general peripheral-stimulation upon the reflexes of the heart and blood-vessels; in order to occupy ourselves solely with the facts pertaining to massage.

Every one may readily convince himself of the fact that, when a person with cold feet has vigorous friction applied to the sole of one foot, a distinct sensation of increased temperature ensues in the skin of both feet.

Zabludowsky studied, by means of Mosso's plethysmographic method, vascular reflexes due to massage (from one arm or leg to the other), and obtained, "in most cases," a dilatation of the vessels; in other cases a narrowing appeared instead.

Zabludowsky has also published the result of a few observations of the "after-effect" of massage upon arterial blood-pressure in man. After massage of one arm, the pressure in the radial artery of the other (which before the massage showed a

* Parenthetically, I would ask the reader to note this case carefully. The way Mezger treated it is a striking proof of the famous Amsterdam doctor's excellence as a masseur.

pressure of 125 millimeters of mercury, measured by means of Von Basch's manometer), rose 10 to 20 mm., in from 10 to 30 minutes' time.

The results of such an experiment are entirely inconclusive, as I shall show below. Zabludowsky does not state what the pressure was *during* the continuance of the massage, nor, furthermore, how the massage was made upon the other arm, and there is great likelihood that the last named circumstance is of much importance.

The matter could be easily determined if we were able to argue from the laws which obtain in one order of animals to those that obtain in another order; but the case is not so simple. There are decided differences in this respect, between dogs and rabbits,* for instance, and also, in all probability between these animals and man. With an express caution to bear this in mind, I cite the results which I have reached myself † in experiments on rabbits, in order to show what factors *may* enter here.

In my experiments, I completely separated the stimulation of the skin from the stimulation of the muscles, and was able thereby to obtain a much clearer idea of the nature of these extremely complicated vascular reflexes. The experiments were made in such a manner that one leg of the animal was entirely stripped of its skin; purely muscular stimulation—muscle-massage—was then made upon the denuded muscles. Stimulation of the skin—skin-massage—was then given either by various manipulations made on the skin which had been stripped off, but which was still connected with the rest of the skin and retained its full vitality, or by lightly brushing (so lightly as not to excite the underlying muscles), other parts of the animal, as for instance, the other hinder extremity. The blood-pressure was registered in the usual way, by the carotid artery, (a solution of peptone being used, at Professor Tigerstedt's suggestion, as the fluid in the manometer).

The results of a large number of experiments (on about forty animals) were uniformly the same, and showed that purely mechanical stimulation of the skin, of whatever strength (above a certain minimum which had no influence on blood-pressure), whether as light strokings, or hard kneading and pinching, caused an immediate and tolerably prolonged rise in blood-pressure, which later (when the stimulation was long continued, often during the same, sometimes after it), returned to its original level, with or without sinking below it.

It was likewise shown by all the experiments that a purely mechanical stimulation of the muscles, of whatever strength (above an utterly insignificant and ineffectual minimum), be it made by light stroking of the denuded muscles, or by weak or powerful pinching--pétrissage, caused an immediate (in ten to thirty seconds) and quickly passing fall of blood-pressure, after which (or if the stimulation continued beyond a certain time, then during the same) it returned to its former level, with or without having risen above it.

The result of stimulating muscles and skin at the same time, as in ordinary massage, depends on which form of stimulation is the stronger. If I grasp the muscles through the skin and knead them, stimulating the skin no more than results from the contact of the finger-tips with it, then I can readily call forth a fall in blood-pressure corresponding to the beginning of the stimulation of the muscles. If, on

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* See Heidehain and Grützner's article. Pflüger's Archiv, 1877, p. 52.

† E. Kleen : Om inflytandet at mekanisk muskel-och hudretning po det arteriela blodtrycket hos kaninen. Föredrag i Sv. Läkaresällskapet, 12 April, 1887, intaget i Nord. Med. Ark., 1888, xx B , No. 10. "On the influence of mechanical stimulation of the muscles and skin upon the arterial blood-pressure in rabbits. A paper before the Swedish Association of Physicians, 12 April, 1887, contained in the Northern Medical Archives, Vol. xx, 1888, No. 10."

the other hand, I stroke the skin, give it effleurage in other words, and so arouse a stronger stimulation over a considerable area of the skin, then it readily comes to pass, although the muscles are simultaneously stimulated—that the rise in blood-pressure, due to stimulation of the skin, completely counterbalances the initial fall of pressure due to stimulation of the muscles.

Curare increases in a high degree the reflex excitability of the skin. In an animal under the influence of this poison, therefore, the rise in pressure, from a very weak stimulation of the skin, predominates over the fall, due to the stimulation of the muscles.

Chloral, on the contrary, lowers the skin's reflex excitability. It is possible, therefore, to demonstrate with great certainty the curve of muscular stimulation, with its initial fall of pressure, on a rabbit that has had a proper dose of chloral, even though the skin be simultaneously excited. When sufficiently strong doses of chloral have been administered, a purely mechanical stimulation of the skin gives no result.

Concerning the frequency of the pulse and its determining facts, I am unable to speak decisively. In experiments with rabbits, I have observed at the beginning of a temporary excitation of the skin, that there is sometimes a quickening of the pulse, and sometimes a slowing of it, with higher pulse-waves, due to an evident vagus-reflex. When the stimulation is purely muscular, a retardation of the pulse occurs, *at least in most cases*, and in all that I have observed. Both acceleration and retardation are frequently followed by their opposites. I am not able to agree with others (Naumann, Gopadse), who say that the strength of the stimulus is the determining factor in this regard; so that a strong stimulus should produce retardation, and a weak stimulus acceleration of the pulse. I have recently observed, in man, that very vigorous and painful tapotement of the right calf was followed by a considerable acceleration. The same result, only less pronounced, was obtained by making powerful effleurage in the same place. In both instances the acceleration was followed, after the close of the stimulation, by a perceptible slowing of the pulse. In experimenting with other individuals, I have seen retardation even at the beginning of a tolerably weak stimulation. Many factors are here operative, among others, doubtless, the frequency of the respirations and, probably, varying conditions peculiar to the individual.

Concerning the effect of peripheral mechanical excitation upon the rapidity of the pulse, we can only say, for the present, that a change is produced in it. As regards its influence upon arterial pressure, I think I have reached some degree of certainty —in the case of rabbits. As regards human beings, we know little more than Zabludowsky has shown, and his experiments are not altogether convincing, as the manometer of Von Basch, which he employed, does not yield accurate results. For practical purposes it is enough to know that blood-pressure rises for a while under the influence of massage, especially of "ventral-massage."

So much for mechanical stimulation of the nerves.* Nerve-

* In the special part of this volume, in the chapter on Nerve-massage, I shall speak of certain facts, which are of therapeutical value in this connection, though their physiological bearing is not clear.

massage signifies altogether more, as will be seen further on, when it is employed to remove the products of chronic inflammatory processes from the nerve-trunks, thickenings in the neurilemma, etc., than when it is employed simply as a nerve stimulant.

We have now considered the most essential physiological effects of local-massage. To none of the forms of local-massage, whether it be that of a joint, a group of muscles, a nerve or any other part, can we attribute any influence, worth mentioning, upon the processes on which the interchange of material in the body as a whole depends. Such an influence, on the other hand, is to be assigned to two forms of massage which I considered in detail in the foregoing chapter; namely, general-massage and abdominal massage. It behooves us therefore, to glance at the physiological effects of these two forms of massage,, which, in practice, are of prime importance.* Investigations as to their influence upon the metabolism of the body, which should be of scientific worth, would be difficult and time-consuming, and must embrace a large number of cases. Moreover, the investigations which have so far been made only justify our guessing, what could already be asserted on *à priori* grounds, that long continued massage increases the interchange of material.

Zabludowsky made general massage daily upon three persons for ten days; analogous examinations were made for eight days before massage was given, and were continued for eight days after it had ceased. Two of the persons—one was fat and one lean—lost weight; and one increased in weight during the period of massage treatment. The last mentioned showed a decreased secretion of nitrogen and an increased secretion of sulphuric acid in the urine, while in the urine of the two first mentioned the amount, both of nitrogen and sulphuric acid compounds, was increased. So far as I can see, no conclusions at all can be deduced from these cases, and it would have been equally impossible if the patients' food had been accurately controlled and had the excrement, as was not the case, been included in the examinations.

Gopadse made four experiments which were more accurately conducted, each covering a period of three weeks, and taking into account all nitrogenous income and expenditure. He found that all four persons showed increased appetite, heightened power of assimilation, and an increased conversion of nitrogen-containing material. During the massage period, two gained in weight, one lost, and one remained as heavy as he was before. After the massage-treatment all four increased in weight.

Bum reports that general massage increases the amount of urine secreted (Zeitschrift für Klinische Medicin, 1888, p. 248).

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* We have already touched, in the last chapter, upon the third form of massage—throat-massage, whose technique was discussed in that chapter. Its physiological effect may be shortly characterized as local acceleration of the circulation.

Keller notes that general massage augments metabolism and the excretion of nitrogen-containing products, as well as of the sulphuric acid compounds, the chlorides, and lime-salts (Schmidt's Jahrbücher, 1889).

Weir Mitchell, whose investigations are, beyond question, worthy of great consideration (although according to Weir Mitchell's own opinion, they are not completely decisive), believes it is established that general massage gives rise to a considerable increase of metabolism, which lasts for about three hours after the administration of the massage, and that this is followed by a compensatory diminution, so that the total amount of elimination during twenty-four hours undergoes no special change. ("Fat and Blood." Philadelphia.)

Wharton Sinkler reports, in Weir Mitchell's work, that general-massage raises the temperature of the body.

General-massage has an invigorating effect upon the circulation, partly by accelerating the blood-stream in the portion of the body under manipulation, and partly through its reflex effects upon the heart's activity. Furthermore, it strengthens the muscles; and the various manipulations made upon groups of muscles, especially tapotement, are of great value. Moreover, general-massage includes the so-called ventral-kneading with all the effects peculiar to it.

Finally, a few words regarding the so-called abdominal-massage, or ventral-kneading, whose technique we have described above (p. 47).

The manipulations of abdominal-massage act through the abdominal walls upon the organs contained in the abdominal cavity, especially upon the alimentary canal and the glands pertaining to it; upon the epithelial elements, the smooth-muscle fibres, and the nerves of the intestine.

Abdominal-massage, of course, acts upon the skin and walls of the abdomen; but this action is of infinitesimal practical import, even when it concerns the so frequently described and too much emphasized strengthening of the belly-muscles.

It is highly probable that abdominal-massage acts very powerfully on the glands and epithelium of the alimentary canal, as well by its stimulating effects upon those organs, as by its excitation of their respective nerves. We are reminded that Beaumont observed that a richer secretion of gastric juice set in, in the case of his world-renowned patient, when he lightly stimulated by mechanical means the mucous membrane of the stomach, through the fistula. Analogous phenomena have been observed in cases of intestinal fistula (Thiry). We know how easy it is to produce unmistakable secretory reflexes in other parts of the alimentary canal, as, for instance, one may see a

copious secretion of saliva excited by the utterly insignificant mechanical stimuli which intestinal worms exert. We should be mindful, too, of the fact that, in the case of reflexes, not only promotive but also inhibitory influences may make themselves felt; for instance, through vagus and through sciatic stimulation, it is possible to render the pancreas inactive. (Bernstein, Afanasiew, Pawlow.) *How* the different secretions are altered by means of abdominal-massage, is quite unknown to us at present.

The appetite is strikingly improved in almost all cases of massage.

It is evident from Gopadse's experiments, that the power of assimilation is augmented.

The renewal of the epithelium of the alimentary canal becomes more active under the influence of massage. When the large intestine is massaged—a procedure frequently resorted to with patients who suffer from constipation—great masses of mucus pass off in the fæces, especially at the beginning of the treatment; being the result of the quicker destruction and mucus-metamorphosis of the epithelial cells.

Blood-pressure rises during abdominal-massage, in all likelihood on account of the direct and reflex excitation of the splanchnic nerves, or at any rate as a result of the constriction of the arteries of the mesentery which follows it. When the manipulation is made over the abdominal aorta, compression of the latter has similar effects; the height of the pulse-wave likewise is increased. I have frequently seen this effect continue for an hour after massage of five minutes' duration, in observations on the human subject, when a *sphymographe-à-transmission* was used, during abdominal-massage to register the radial pulse.* The pulse which shows itself weakly dicrotic, as a rule, before massage, becomes strikingly dicrotic during its continuance, or even tri- and tetracrotic. We should naturally expect to find a slowing of the pulse during abdominal-massage, after the analogy of the events which occur in the "clapping-experiment" of Goltz, and from what frequently takes place, at least in rabbits, in such procedures. But in men, I have repeatedly found an acceleration

* The experiment is easily carried out, if the corresponding forearm be very carefully fixed; otherwise the curve is readily spoiled by the shaking due to the "kneading." Would we study the after-effect, the person under observation, naturally, must remain motionless, in a supine position, on the massage-bench.

of the pulse; in the experiments I have made touching this point, which be it said were not very numerous. The frequency of the respirations became increased, at least in many cases.

The most important influence of abdominal-massage consists, doubtless, in the stimulation which affects the smooth-muscle fibres of the alimentary canal. By this means they are caused to contract, and, under such stimulation, repeated daily, gradually become strengthened, just as the skeletal muscles become stronger under tapotement. This explains the power which abdominal-massage has to mitigate, in many cases, the symptoms of dilatation of the stomach (but not the affection itself), and even to abolish them; just as it is often capable of curing chronic constipation, due to insufficient power of the muscles of the intestines and to weakened peristalsis.

On the contrary, the reflex influence upon peristaltic movements, which some authors designate an essential one, is surely of slight therapeutical value. Such an influence will not explain cases of extreme frequency, where persons who have suffered from constipation for many years, later, *after* a sufficiently prolonged massage-treatment, without employing any other means, become permanently normal as to their peristaltic movements and have daily stools. It is inconceivable that such a change should result from repeated reflex-actions and their influence upon the corresponding nerve centres or on other elements. Besides, it must be remembered that these reflexes have not as yet been fully elucidated, and that in abdominal-massage it is quite as allowable to hold them to be inhibitory as helpful reflexes. So far as is known at present (aside from the glanglionic nerve-plexus belonging to the intestine), the cœliac, mesenteric and hypogastric plexus, the sympathetic nerves, the spinal-cord, and the vagus (at times), assuredly have a quickening effect upon the movements of the intestine; whereas the splanchnics, which in abdominal massage are most certainly stimulated, both directly and reflexly, act as inhibitors.

Of still less consequence is the circumstance that massage *occasionally* shortens the period during which the ingesta are retained in each particular section of the alimentary canal. That this does happen, and in all parts of the canal, is absolutely certain. Gopadse has demonstrated the fact as regards the retention of certain food materials in the stomach; and any one who will visit a physiological laboratory, may readily convince himself that the excitation of a knuckle of intestine, for instance by pinching, produces a contraction which passes downward and contributes its share towards pressing the intestinal contents onward. That abdominal-massage shortens the stay of the fæces in the large intestine is demonstrated every day, where that form of massage is in use. But I cannot agree with those who hold that the quicker passage of food material through the different sections of the alimentary canal is an essential part of the great therapeutical value of "ventral-kneading." I am especially unable to find in such a doctrine any explanation of its happy influence in dilatation of the stomach, because even in that case, the frequently long-continued improvement and mitigation of the intensity of the symptoms, *after* all treatment has ceased, points to other and more essential factors. One such factor, in my opinion is, as I have said, the strengthening of the *muscularis* of the intestine through oft-repeated mechanical stimulation.

CHAPTER IV.

CONTRAINDICATIONS TO MASSAGE.

A considerable number of diseases and abnormal conditions forbid or restrict the use of massage in cases wherein it would otherwise be indicated. The contraindications either relate to all massage whatever or, as is more frequently the case, preclude its employment within the domain of the diseases or changed conditions in question.

Massage demands, first of all, a tolerably normal skin; and is therefore, *ipso-facto*, excluded in certain skin diseases. Unhealed traumata of recent occurrence, burns, erysipelas, syphilitic skin-diseases of many sorts, certain forms of eczema and herpes, pemphigus, acne, furuncle and carbuncle * all exclude massage from their respective domains. In many cases certain manipulations may be employed, in which certain other manipulations would be entirely inadmissible. For instance, one may work with frictions upon extensive scars when the cicatricial layer which lies under the finger-tips follows the latter in their small excursions, even when the scar-tissue is bound fast to the subjacent tissue; but it would not do to employ vigorous effleurage in such a case, as it obviously would cause rupture and ulceration. Strong effleurage is, on the whole, the form of manipulation which is principally excluded by anomalies of the skin, and is

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* Dr. Windelschmidt, of Cologne, has written (in the Allgem. medic. Centralblatt, 1883) an article on "Massage in Acne, Furuncle, and Carbuncle." But even Windelschmidt gives massage only in the initial stage and when there is but little pus. Massage may be considered in such cases properly enough *after* the cessation of the purulent process and after healing, when frictions and effleurage here, even as elsewhere—*e. g.*, after a tedious erysipelas—are fitted to overcome the residual infiltrations. How far and under what circumstances it is possible to interrupt the development of acne, furuncle or carbuncle *before* purulence has set in, I do not know; but, inasmuch as recent investigations point to bacteria-vegetations as very probable ætiological factors, such an influence as that suggested seems scarcely tenable. If there be purulence, whether it be considerable, or inconsiderable, I hold that massage should never be employed. It is of great importance, nowadays, to let nothing contribute to the extension of the indications for massage beyond their due limits, and even the title of Dr. Windelschmidt's article strikes me as extremely unsuitable. I fear there are many people who do not require any plainer hint than that to begin massaging a florid carbuncle, for instance, to the imminent danger of their patients.

scarcely to be employed even in some forms of the same, such as certain erythemata, urticaria-like pomphi, small or linear sores and purely secretory anomalies as well.

Certain vascular diseases and changes contraindicate massage within their territory, and others call for great caution in its use. Aneurisms may easily burst under manipulation, and besides threaten the formation of emboli. Atheromatous processes also forbid local manipulations, which may loosen portions of the internal wall of the arteries, and also work mischief in other ways. Well developed varices, with or without phleboliths do not admit, for similar evident reasons, of energetic manipulations in their immediate neighborhood.* On the other hand, cautious effleurage may do good in many cases of chronic phlebitis or periphlebitis, and the affections consequent upon them; a point to be considered later. Acute phlebitis and periphlebitis absolutely contraindicate any sort of massage within the area of their influence, seeing that the additional irritation would cause still more extensive inflammation, and, in addition, be likely to increase the danger of embolism from the thrombus-building which frequently takes place of itself in these processes. Lymphangitis, which is always of septic origin, likewise, means "Hands off!" to the masseur. Recent or incompletely organized thrombi, on account of the danger of promoting embolism, forbid the use of massage in or near their territory.†

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* Chief-Staff Surgeon Dr. Starke, has employed cautious strokings to empty the dilated veins when the foot is raised before the application of a flannel bandage,—a procedure which may be of value when it is very skillfully executed, but which, even if you choose to call it massage, does not vititate the contraindications against any more vigorous use of this means within the domain of pronounced varices.

† Early in my activity as a practitioner, I learned by sad experience the necessity of not rebelling against this contraindication of massage. A highly esteemed colleague asked me to undertake the massage treatment of a patient to whose case he was unable to devote the requisite amount of time. The case was that of a forty-year old factory owner, who had broken his femur at the boundary between its middle and lower third. During healing, a considerable callus had formed and a compression-thrombus had developed in the femoral vein. *More than five weeks had now elapsed since the thrombus first declared itself;* collateral circulation formed slowly; the whole leg was much enlarged by a hard œdema; the knee-joint was completely stiff; the ankle-joint was circumscribed as to its movements. There was every prospect of the formation of connective tissue, of great muscular atrophy, and of severe and protracted functional disability in the future. I at once pointed out the danger of embolism; but my friend laid stress upon the safe age already attained by the thrombus and the advantage of not postponing the massage treatment. I therefore began it,—avoiding with great care the neighborhood of the thrombus—and all went well for a week. Then, to my great horror, my patient had a sudden attack of chill and fever, some hours after a massage sitting. Soon I found a circumscribed

Finally we mention under contraindications certain rare forms of disease in which the blood-vessels suffer from irreparable changes, on account of which, procedures that in ordinary circumstances would be innocuous, may give rise to severe bleeding. Such are hæmophilia, morbus maculosus Werlhofii, scorbutus and certain cases of purpura and leukæmia. Occasionally one finds, outside of these affections, such a sensitiveness on the part of the vascular walls to mechanical influences (this is especially the case among elderly persons), that massage manipulations have to be made with extremely moderate force.

Purulent processes of all kinds contraindicate all massage, as in their neighborhood it would only serve to increase the danger of spreading the pus more widely throughout the tissues and contributing to their further destruction.

I have heard of several cases of this sort, which have occurred in Scandinavian countries (*"quæ nunc enumerare longum est"*), in which unscientific masseurs, through their ignorance of such conditions, inflicted wearisome suffering upon their patients, and in one case well-nigh caused death.

Malignant Tumors.—The massage of malignant tumors *in loco* increases the danger of metastases. We must also recognize that massage in the neighborhood of tuberculous and other *foci of infection* contributes to the danger of extending the poison.

Foreign bodies evidently constitute a hindrance to massage in their proximity.

Recent Fractures.—In recent fractures, massage cannot be performed near to the fracture, on account of the rubbing of the soft parts against the fragments, and the dislocation of the latter which would ensue.

Effleurage, which is prescribed by some for the sake of promoting the resorption of the extravasations, must, in many cases, be made centripetally from the site of the fracture; in general, it should be thus made, I may add. In other cases,

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area of evident dullness over the back-lower part of the right lung. I stopped the massage and treated him by appropriate measures for his lung trouble, from which he soon recovered. After which, having taken counsel with my colleague, the massage treatment was promptly resumed, beyond a doubt to the great advantage of the patient. Nevertheless, I should now wait much longer, before undertaking massage in such a case. I cite this, by no means pleasant case for me, for the warning of others. Howbeit, I got off pretty easily in this case; other physicians have had the hard fortune of causing the death of their patients through giving massage too near a thrombus.

if great care be employed, effleurage may be given over the place of fracture.

Fresh luxations forbid local-massage, as applied to them, and I consider the proposal to use massage here also (in order to remove the extravasation and render the reposition easier) as entirely unwarranted. Such treatment can only conduce to unnecessary pain for the patient, as well as hinder rather than help the reposition, which is always the more easily made the more quickly it is attempted after the luxation.

Osteomyelitis and Periostitis.—Osteomyelitis, as well as periostitis, forbids the administration of all massage to the adjacent parts, on account of the extreme sensitiveness to pressure which attends it.

Constitutional and Local Affections.—Severe constitutional or local affections, which necessitate complete rest on the patient's part, do not permit of massage. In the first rank here belong febrile diseases.

Psychoses and Neuroses.—Certain psychoses and neuroses render every kind of massage impossible, owing to the irritability and lack of self-control of the patients. In extreme neurasthenia and in many forms of debility, attended with augmented sensibility to pain, any form of massage that is painful must either be given up, or be given very lightly and with especial regard to the patient's sensitive condition.

Abdominal-massage also deserves special mention in this chapter, since various changes in the abdominal organs, besides those already mentioned, may restrict its employment more or less.

Pregnancy is, in my opinion, a positive contra-indication to abdominal-massage. It has been well established, to be sure, that careful massage even of the uterus itself may take place without shortening the pregnancy or producing any other unfavorable effects on it. (Asp.) Still, in practice it seems best to hold to this contra-indication, even in the first months of pregnancy: in the later stages it would be a great mistake not to do so.

Ovarian Cysts.—Large, advanced ovarian cysts* also consti-

* It is characteristic of the limitless one-sidedness and uncritical enthusiasm for massage which so frequently takes possession of "professional" mechano-therapeutists, that even in our day, when ovariotomy in ordinary cases is to be looked on as an

tute an obstacle to abdominal-massage, which in such cases is either less effective, or may readily act as a stronger excitant to the peritoneum, and so contribute to increase the usual adhesions and complicate an operation. A sudden rupture of the cyst by an incautious masseur is also conceivable.

Acute Inflammation.—Acute inflammatory processes, whether occurring in the abdominal cavity or in its immediate neighborhood, do not justify abdominal-massage, which would by its mechanical excitation further the development of inflammation and especially increase the danger of peritonitis.

Genito-Urinary Affections.—Certain conditions of the kidneys and urinary passages may constitute a hindrance to abdominal-massage. In particular cases of urinary calculus, *e.g.*, after bleeding from the passage of calculi, in hydro-nephrosis, etc., abdominal-massage, obviously, is out of the question.

Wandering kidneys, of whose common occurrence, especially in multiparæ, any one who gives frequent abdominal-massage will soon be convinced, do not constitute an objection to abdominal-massage; but during the manipulation one must regard and avoid them.

Gall Stones call for caution in the manipulations, if massage has to be given near to the gall-bladder; during the passage of stone, or during an inflammation due to it, abdominal-massage must be omitted.

Echinococcus.—In cases of echinococcus, abdominal-massage may bring about the bursting of the sac, which frequently is a very dangerous thing.

Catarrhs, Ulcers, etc.—In acute catarrhs, ulcerations, strangulated herniæ, etc., in the alimentary canal, massage, for the most obvious reasons, must not be thought of.

In cases of round ulcer of the stomach, or of duodenal ulcer, abdominal-massage is necessarily contraindicated, because the excitation which accompanies it may hinder the healing of the ulcer,* or possibly cause it to bleed.

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operation involving comparatively little danger, there are found persons who would employ massage (and of necessity vigorous massage) to bring about resorption of the contents of an ovarian cyst or to prevent their formation. *Fiat massage—pereat mundus.*

* It strikes me as peculiar, considering that gastric ulcer is by no means a rare disease, though frequently hard to make out, and considering the enormous spread of abdominal-massage in the north of Europe, that, so far as I know, not a single instance of such a calamity has been met with.

Since abdominal-massage increases blood-pressure to a noticeable degree, it would not be unreasonable to set up as contraindications, *all conditions which give cause for bleeding through the rupture of blood-vessels.* In recent bleeding within the brain, in the lungs or stomach, and in case of well-developed aneurisms, abdominal-massage is not to be thought of.

Some years ago I was asked whether a patient long a sufferer from chronic constipation, but who had recently had a syphilitic softening, due to cerebral bleeding, might be treated with abdominal-massage or not. I thought it best to advise against such treatment, among other reasons, on the ground of the contraindication I have set forth above.

CHAPTER V.

CONCERNING THE SIMULTANEOUS EMPLOYMENT OF GYMNASTICS AND ORTHOPÆDICS WITH MASSAGE.

Gymnastics and orthopædics are called upon so frequently to co-operate with massage, that a very brief exposition of the significance of the first two and the reciprocal relation of all three methods of treatment seems to me to be in place here.

Gymnastics,* as I have said before, constitute a systematic exercise of the organs belonging to the motor apparatus, and ought to be employed simultaneously with massage in the majority of cases (not in all) of disease or diseased conditions which comply with the indications for massage. In some other affections, also, as is more particularly shown below, the two forms of treatment ought to be employed simultaneously. For the physician who knows the movements which are normally executed by each particular joint, as well as those in which the activity of especial groups of muscles finds its expression, it is an easy matter to prescribe gymnastics in every individual case which calls for gymnastic treatment.

Gymnastic movements are divided by Ling and his school into (1) *Simple*, which are either *passive* or *active*, and (2) *Compound* (double, duplicated), which are either *concentric* or *eccentric*.†

Schematically arranged, they are as follows :—

Gymnastic movements.	Simple.	Passive.	
		Active.	
	Compound (double duplicated resisting).	Concentric (active-passive, contracting).	
		Eccentric (passive-active, protracting).	

* From *γυμνάζειν*, to exercise.

† Ling called the compound concentric movements active-passive, and the compound eccentric passive-active. The terms used here are due, if my memory serves me, to Neumann. The compound movements have also been termed resistive movements. In compound concentric movements resistance to the movement is made by an external force; in the compound eccentric movements, on the other

Passive movements are such as the gymnasticizing person, the patient, executes without any innervation of his own muscles, through a movement-giving power external to himself—be it the force communicated by another person, by a machine, or by gravity.

Active movements are those which the gymnasticizing person executes through the innervation of his own muscles, without the movements encountering any resistance from any force external to himself.

Compound concentric (active-passive, shortening) movements are those which the gymnasticizing person executes, while some external force exercises a certain resistance to them. If I flex the arm at the elbow, while another person, having grasped my hand, makes resistance to my movement, then I execute a compound concentric movement. If I then extend the arm, while another person, or any other external force whatever, continues to offer resistance to my movement during its execution, this movement of mine is an example of a compound concentric movement. In both cases the acting muscles contract in the same way as in simple active movements, "their two end-points concentrically approach their middle point."

Compound eccentric (passive-active, protracting) movements are such as the gymnasticizing person executes by means of a force outside himself, while he makes resistance against such force; thus, if my extended arm is flexed at the elbow-joint by means of an external force—for example, by another person—while I myself counteract that movement through my extensor muscles, *i. e.*, by the innervation of the triceps brachii, then do I, with my arm, execute a compound eccentric movement. Further, if my flexed arm is extended by an external force—by another person, for example—while I, through innervation of my flexors, resist the movement, then the same is another example of a compound-eccentric movement. In both cases my active muscles are lengthened, in spite of a series of

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hand, it is made by the person who is gymnasticizing, *i. e.*, he who takes the gymnastics. Finally, compound concentric movements have been termed compound shortening movements, because the active muscles or groups of muscles are shortened thereby; while compound eccentric movements are termed compound lengthening movements, since the muscles or groups of muscles concerned in them are thereby elongated.

small contractions, "their two end-points withdraw eccentrically from their middle point."

The essential difference between concentric and eccentric compound movements is, then, that in the first the active muscles are shortened, while in the latter they are lengthened. As regards their nature and physiological effects, it is readily perceived that both kinds of compound movements differ but little from the simple active movements.* In practice, however, they possess the advantage of permitting an accurate definition of the mechanical work which is performed by the gymnasticizing person.

Passive movements are classed with gymnastics chiefly on the ground that they afford exercise to the joints; and they fill a very important office in the treatment of diseased conditions of the same. By means of passive movements adhesions or other organized products of inflammation are stretched or torn apart; shrunken articular capsules and ligaments are stretched, and portions of the synovial membrane which have grown together from long-continued contact are separated again: all of which tend to bring about, more quickly than would be possible otherwise, a restoration of lost functional power and to prevent the changes which result from a too protracted rest, such as excessive shrinking of the soft parts, vascularization, connective-tissue metamorphosis, and in some cases, finally, the growing together and ossification of cartilages, etc.

Furthermore, passive movements promote the free play of tendons and muscles in their sheaths; prevent or remove the

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* If, when my arm hangs at my side, I flex the forearm upon the arm, the movement is called a simple active movement. The flexors perform so much mechanical work that they overcome the resistance which the forearm exerts through its own weight (plus that due to some miminal factors of resistance that I leave out of account). If I have a weight in my hand in such a case, or let another person resist the flexion, then the movement becomes a compound concentric one, which, as regards the activity of the muscles, differs only from the flexion first named in that it accomplishes a larger amount of mechanical work.

If while the arm is flexed I suddenly stop all muscular innervation, then the arm will be quickly extended by the weight of the forearm, which "falls down"—a purely passive movement devoid of all muscular work. But if I bethink myself, instead of completely ceasing to innervate my flexors, to make the flexors slowly perform a very slight amount of muscular work, just enough to overcome the weight of the arm, so that it "sinks downward" slowly (and so that the extensors at the same time are not at all innervated), then it is very evident that this movement, in which the flexors are functionally active and elongated at the same time, does not differ essentially from a compound eccentric movement, though it is not given that name. If I make the extensor force greater by carrying a weight in the hand, such a movement is named compound eccentric.

growing together of the same; forestall contractions which may result simply from the fact that a muscle has not been stretched for a long time; and stretch parts that are already contracted. Nevertheless, I would say, in this connection, that the power of passive movements to stretch tissues is tolerably limited, and that we have far more powerful means for this purpose in various orthopædic procedures.

Meanwhile the muscles do not exercise their proper function in passive movements, their extensibility and elasticity alone coming into play. Even in the resting muscle, as we all know, respiration takes place, oxygen is taken up, and carbonic acid given out, so that the blood which is arterial on entering the muscle is venous on leaving it; contractile energy is stored up, which later, under the influence of the motor nerves, is turned into mechanical work. The rapidity of metabolism depends on the degree of muscular tension. It cannot be assumed that the chemical action within a muscle which is moved passively is essentially different from that of a resting muscle, although the passive movements do modify, to some extent, the conditions of the circulation within the muscle.

The specific element in gymnastics is found in the simple active and compound movements, in which the respective muscles perform mechanical work, and whose movements have the same physiological effects, as is readily perceived. We know nothing at all of the slight difference which may be reasonably supposed to exist between concentric and eccentric resisted movements, so far as muscular contractions, circulation, etc., are concerned. In a working muscle the vessels are widened, the blood has freer course, the intra-muscular respiration becomes more active, and the interchange of material becomes quicker. We may now consider it certain that, in hard work, the albumin of the muscle, as well as the fat and carbohydrates, takes part in the metabolism, though fat and carbohydrates are the larger factors in hard work and the only ones in moderate work. The consumption of oxygen and the formation of carbonic acid are also augmented; so, too, lactic acid, the ether- and alcohol-extractives, and the amount of water, are increased; while the extractives by water, the lactic and carbonic acid constituents, the unstable fatty acids, and kreatin, kreatinin and sugar, are diminished. Simultaneously, muscular irritability is diminished; and the muscle gradually

becomes fatigued, in spite of the enhanced supply of blood, which cannot long compensate the opposing factors. This is principally due to the accumulation of the so-called fatigue-products (carbonic acid, lactic acid, acid-phosphate of lime, etc.), through the consumption of oxygen, and through the lack of material which may be still further oxidized. Heat-production is increased and the temperature of the blood within the muscle, and in the circulation outside of it, rises. The secretion of nitrogenous bodies in the urine is increased. The urine, which is somewhat lessened in quantity during muscular work, increases in amount immediately after it.

The nutrition of the muscle itself is favorably affected by exercise; and we are all familiar with the fact that, just as a prolonged period of inactivity produces an "*atrophia ex inusu*," exercise will restore a muscle to its normal volume, or even cause functional hypertrophy.

So much for the effect of gymnastics upon the muscles themselves. Gymnastics are of importance, however, in still other directions. Just as we have good reasons (which every medical student knows) for assuming a trophic influence upon the muscles from their corresponding nerve centres, so may we assume (especially since Gudden's experiments on the enucleation of the eye, and the series of investigations since instituted on this question) that there is a reciprocal influence exerted upon the same nerve-centres by the muscles, and that the nutrition of the former depend largely upon that of the latter.

We know, likewise, that similar reciprocal relation exists between the muscles and their nerve trunks (Flechsig).

The influence of gymnastics upon the circulation is of paramount importance. Since a working muscle, as was said above, takes up more blood than a resting muscle, and since the muscles represent a very considerable part (45 per cent.) of the total volume of the body, the power of gymnastics to compensate certain anomalies of the circulation and to deflect the blood from congested internal organs into the muscles, is very evident. Gymnastics' well known influence upon the heart, whereby it makes the heart-beats quicker and stronger, and thus strengthens the heart muscle itself, belongs here; a fact which lately has been practically applied to the treatment of some heart diseases, both in German and Scandinavian lands (see Index).

Finally, it is generally known that gymnastics quicken the respiration, increase the radiation of heat and the secretion of sweat (and other secretions, doubtless), cause more vigorous peristaltic movements, improve sleep, help the appetite, and exert a favorable influence upon the general bodily condition.

It does not lie within the scope of this work to discuss the special hygienic and therapeutical measures of gymnastics as an effective means of maintaining the health; of counteracting the results which so commonly follow, in civilized life, on too little or irregular muscular activity; of removing or bettering anomalies of the circulation, of the motor apparatus, or of the general nutrition. In the special sections of this work, these matters will be noticed only in connection with those cases in which gymnastics ought to be employed in combination with massage.

Orthopædics* are properly the treatment of bodily deformities. Since this form of treatment is for the most part carried into effect by means of mechanical devices and apparatus of various sorts, the word orthopædics, has come to denote the mechanical treatment of such conditions; and in that sense I shall use it here.

All forms of orthopædic apparatus have a common aim, in that they are intended to restore those parts which have suffered changes of form to their normal condition, or to prevent the further development of deformity, by means of stretching, pressure, or support, and sometimes through fixation, or through the limitation of movements.

Orthopædic treatment works, often, like many other therapeutical measures, in various directions. Pressure and immobilization may be necessary to counteract deviations from the normal shape or form, or for other purposes; but, on the other hand, they exert an unfavorable effect upon the circulation and nutrition of the parts concerned, especially if they be muscles. Massage (and gymnastics too), as is evident to any one who understands its physiological effects, on this account, not only subserves the same purpose as orthopædics when they are employed simultaneously, but has a special office besides, namely, to counteract the above named prejudicial effects of orthopædic treatment. It is of very great importance not to lose sight of this relation, which

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* *ορθός* = straight; *παιδεία* = education.

frequently necessitates the employment of massage after orthopædic treatment.

Nevertheless, the field common to orthopædics and massage is not a very large one. Orthopædics, *per se*, have a tolerably limited function, and can be used only for certain deformities. In many other cases, orthopædics afford no help, for instance, in certain defects of the osseous system, in new growths or hyperplasiæ of a bony nature, deforming joint-affections due to destruction and resorption, in cases of alteration of the shape of the skull, from rachitis, hydrocephalus, or infantile facial paralysis. In other cases, orthopædics are the more surely effectual, and massage is valueless, at least for direct treatment of the deformity. I refer here to changes of the skeleton which occur in the back and the lower extremities especially, as the result of diminished power of resistance of the bones in rachitis and osteomalacia; and also to the malformations which occur in the pelvis or the extremities, preferably the lower, through arrested or asymmetrical growth of certain bones.

On the other hand, it is often necessary to employ massage as a means to counteract changes which are intimately connected with deformities. Its peculiar office, in this connection, is to strengthen atrophied muscles. Massage, on this account, is of value in combination with the orthopædic and gymnastic treatment of ordinary deformities of the foot, whether congenital or acquired. In the treatment of all paralytic deformities, massage plays a more important role than gymnastics, which are often excluded by reason of the abolition of the functional power of the muscles. As regards the deformities arising from articular inflammation, the office of massage is to remove the products of inflammation as well as to oppose atrophy of the muscles. In those deformities which come from the extensive formation of scar-tissue, massage is worth considering, inasmuch as it is capable of restricting a still active formation of such tissue within proper limits, of bringing a portion of the already organized inflammatory products to resorption, of thinning the scar-tissue, and thereby lightening the work of the gymnast and the orthopædist.

Since I have enumerated in the foregoing, the services of which massage is capable in regard to deformities, it seems in place to mention some of the things it cannot do. It has no power directly to stretch or shorten shrunken or lengthened tissues of any sort whatever. Such functions belong wholly, in case of the first, to gymnastics and orthopædics, and in case of the second to orthopædics.

CHAPTER VI.

TRAUMATA — SKIN DISEASES — ŒDEMA — SUBCUTANEOUS INFILTRATIONS — CHRONIC PHLEBITIS AND PERIPHLEBITIS—ULCUS CRURIS — TELEANGIECTASIS — EXTENSIVE SCARS, WITH CONTRACTURES—FROST-BITE.

Massage has shown itself a capital remedy in *traumatic affections* of various kinds, which is easy to understand, since its merits in this respect proceed immediately from its chief physiological effects. In cases of this kind one calls into requisition the power of effleurage to oppose inflammation, to further resorption; or its capability to improve local nutrition and thereby influence favorably the process of healing and regeneration; or one may take advantage of the co-operative effects of effleurage and frictions, either to limit, so far as need be, the process of reparation and the new growths caused by inflammation, or to prevent the continuance, in one form or another, of extravasations. These services are more or less pronounced, whatever tissues or lesions are in question, whether they concern the skin or the subcutaneous tissue—muscles, nerves, joints, or even, in some cases, the skeleton.

For identical reasons and for similar purposes, massage may be employed after many surgical operations; a fact which is expressly emphasized here, in order to return to it again and again wherever in this work it seems best to do so. I refer, meanwhile, to some contraindications. It is scarcely needful to recall the fact that massage cannot be applied locally where there are extensive external injuries to the skin. But even when such injuries are comparatively limited, we must take into consideration the important fact, which has been pointed out and well elucidated by Gerst, that massage, under such circumstances, increases the danger of septic infection. In traumata connected with external injuries to the skin, one must postpone massage till after the skin is healed; or, in case of less extensive injuries, which are not of themselves such as to render massage impossible, special antiseptic precautions must be taken.

The technique, from what has been said before, is self-evident: effleurage is, in cases of perfectly fresh traumata, the only manipulation to use. Frictions are added, proportionately to the age of long-continued traumatic processes, and constitute the most essential manipulations in the case of changes dependent upon injuries of long standing.

Only the simple contusions and a few other kinds of traumata will be mentioned in this chapter. We shall speak of other kinds in their appropriate places, further on.

Simple contusions have been treated, since immemorial times, by massage, which is a surer and easier means than any other for restoring the tissues to their normal condition, since inflammatory symptoms yield to it with surprising quickness.

Vascular Injuries.—In cases where the smaller vessels have been injured, and hæmorrhagic infiltrations, ecchymoses, hæmatomata, or lymph-extravasations have set in, massage is likewise able, with the greatest certainty, to bring about restitution and to prevent the organization of connective tissue, the formation of cysts, and other more permanent results of an imperfect resorption of extravasations.

Gerst treated forty-one such cases, mostly severe ones, with massage, and effected complete cures; the average time of treatment being 6.5 days for cases in which an upper extremity was affected, and 6.7 days where a lower extremity was the seat of injury.

The power of massage to cause the rapid resorption both of extravasations and transudations has led to extending its use to cases in which, as I think, it may, with impunity, be dispensed with.

Thus effleurage has been recommended for fresh fractures (either over the seat of fracture or centrally from it), in order to promote healing, through a quicker and more complete resorption. I will not deny that such a procedure may be of use in some cases; still, I think, that it is usually better not to employ massage for promoting resorption—which is seldom incomplete or a hindrance to healing in such cases. The proposal to employ massage for similar purposes in fresh luxations, *before* reposition, deserves still less consideration; reposition being, perhaps, always more easily effected the sooner it is attempted. Of the use of massage *after* the healing of fractures, and *after* the reduction of luxations, I shall have something to say later on. Incredible though it appear, it is true that there are redoubtable massage-enthusiasts who would massage away a subperiosteal cephalo-hæmatoma, as well as the largely serous, subcutaneous *caput succedaneum* in new-born infants! Inasmuch as the former, and especially the latter, usually vanish without the intervention of any one (even when the disfigurement of the young fellow-citizen's appearance is most alarming to the horror-stricken relatives), it seems to me a sad misfortune for the little one, that at the very beginning of his life's troubles he should have to do with such enthusiasts, of whom one may have a complete sufficiency later on in life. In cases of large cephalo-

hæmatomata, puncture, under proper antiseptic precautions, is much to be preferred to massage.

In case the violence of the contusion has caused *mortification* of the tissues, effleurage limits the same to a minimum, through the quickening of the circulation and its cognate effects; accelerates the work of reparation after the necrosed parts have been removed by frictions; and prevents purulence and other unfavorable results.

This applies also to the massage of portions of bone; as an example of this, and in order to illustrate the course of a severe contusion, I will cite one of Gerst's cases.

An artilleryman who had been kicked by a horse on the inner-side of the leg, just below the knee-joint, had at that point a tense, hot, painful swelling, as big as a hen's egg. The skin over it was red but unbroken; there was no solution of continuity in the tibia. Severe pains radiated from the swelling. Immediately following the second massage sitting, pain and swelling had almost disappeared. On the third day there was nothing abnormal left, except a "blue-red" discoloration of the skin and a slight sense of pain on pressure over the tibia. Under continued massage treatment, a soft "pap-like" mass developed beneath the skin of the injured place on the fifth day; and the thumb-nail could be pressed into a corresponding depression of the tibia (mortified bone-substance which later underwent fatty degeneration). Under continued massage, the soft mass was absorbed, the cavity in the tibia gradually filled up from the sides with firm substance: on the twenty-fifth day the loss of substance was made fully good, the skin was normally movable and the patient free from all inconvenience.

In all such cases the treatment, besides massage, consists of the application of warm-wet poultices, and placing the limb in a raised position: firm bandaging, ice-bladders, and other external applications belong, in a certain degree, to ancient history.

On account of the influence of massage upon local nutrition, the presumption seems natural, that, when the anatomical conditions are auspicious, it should promote the process of healing of fractures, in cases where healing is abnormally prolonged and a tendency to the formation of false-joints exists, on account of a general or local condition of mal-nutrition. Being desirous to obtain evidence on this point, I turned to Professor John Berg (of Stockholm), with the request that he would send me a suitable case as soon as possible. A case soon presented itself, and as it chanced to be an extremely conclusive one, I subjoin an account of it.

Charlotte A., a seamstress, 42 years old, on July 4, 1886, fell, and broke both bones of her right forearm, at their middle points. After a short period of treatment in the raised position, with ice, a plaster-dressing was applied and allowed to remain six weeks. When it was taken off, almost no bony union had taken place, and there was movement at the seat of fracture in several directions. The ends of the bones were rubbed vigorously against each other, and a new plaster-dressing was applied and

remained on for some weeks. On its removal, it was evident that the condition of things was unchanged. On October 6, the patient consulted Professor Berg, who immediately sent her to me.

The patient was a small, lean, anæmic woman, who had always suffered from poor health, without having had any particular disease; and no evidences of past rachitis were to be found. In the neighborhood of the seat of fracture there were extensive infiltrations of the muscles; no trace of callus on the fractured bones; considerable mobility of the same in different directions. From protracted bandaging, the movements in the radio-carpal joint have become strikingly restricted; the fingers are in contracture, and the hand is useless.

So far the case was a good one for my purpose. But it seemed to me that the two ends of the radius were separated, to a certain extent, by soft parts. I told the patient that I did not think I could do anything for her, and advised her to undergo an operation. The operation took place on October 16, at the Seraphim Hospital, at the hands of Professor Berg, who resected the four ends of the bones (between which bunches of muscular fibres had lodged), and brought them together in the usual way, by sutures of silver-wire. The patient remained in the hospital, under usual treatment, for about three months.

January 27, 1887, she called on me again. I found but little change from the previous condition, excepting the scars from the operation and a close approximation of the ends of the bones. Not a trace of callus-formation could be palpated, and considerable mobility, between the upper and lower parts of the forearm, was found to exist. I now undertook the treatment of the patient, though with little hope of success. She received vigorous and tolerably prolonged effleurage,—at first twice a day, later once a day. During its administration, we sat opposite one another, each on one side of the massage bench. Having grasped the patient's right hand with my left, I made effleurage over the greater part of her forearm, with my right hand. In this way there was not the least rubbing of the resected bones* together, so that effleurage was the only factor present to cause callus-formation. Nevertheless, after a few weeks, a plainly perceptible callus showed itself in the radial, and later in the ulnar fracture-seat. When the treatment ceased, on March 10, the bones were entirely firm at the seat of both fractures. I then prescribed gymnastics and massage for the still existing atrophy of the muscles and the still considerable disturbance of the functions of the hand.

Finally, I make special mention of the great importance of throat-massage, or better, throat-effleurage (which has also been emphasized by Gerst), resulting from its depletory influence upon the corresponding vascular areas, in cases of severe contusions of the head with attendant intra-cranial bleeding, in cases of *commotio cerebri*, and even in cases of fracture of the skull.

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* The method of rubbing the ends of the broken bone together, which is usual in delayed formation of callus, has been characterized by certain mechano-therapeutists as massage. However, I am not able to see that there is any reason for classing this procedure with massage. At any rate its effects are of a totally different nature from those of effleurage, and it had no part in bringing about healing in the case above cited, where it had been resorted to (be it said, in parentheses) earlier without result. The course of the case after the operation leaves small room for doubt that the cause of the formation of a pseud-arthrosis lay in the generally depraved nutrition of the patient.

In these cases the throat-effleurage must be performed with great caution, while the patient, with his head raised, lies in bed; and must be repeated at frequent intervals until the most severe symptoms have passed away.

Gerst treated such a case successfully. A soldier, who had fallen on his head into a ditch, gave certain evidence of severe intra-cranial lesions, by pupillary changes, as well as by paresis and paralysis. The patient received throat-effleurage, continued for some minutes, every hour. The treatment lasted a week.

I come now to some diseases, chiefly of a surgical nature, which wholly or in part affect the skin or sub-cutaneous tissue, and in which massage is employed more or less generally, now-a-days.

We have to consider, among other affections in this class, *those changes in the skin which arise during chronic inflammations, or remain after the subsidence of acute inflammations.* One may, if he chooses, hasten, by massage, the removal of infiltrations after furunculosis and carbuncle, if the latter are healed (see Note, page 68). The use of massage is of more practical importance in the marked changes which often follow a relapse of erysipelas; and I give, as an example of the truly remarkable results which can be attained in such cases by means of frictions and effleurage, the following somewhat condensed history of a case given by Professor Gussenbauer, of Prague:—

In 1881 a seventy-two year old peasant came into the clinic on account of a chronic œdema on his right arm. With the exception of a traumatic injury, which the patient received in his fifteenth year and which was attended by purulence during healing, the extremity was sound until 1847, when the hand and arm became swollen from erysipelas, during the course of a fever. Very frequent relapses of erysipelas occurred during the next few years, so that, on account of attendant changes, the patient lost the power to use his arm. Thereupon, in the course of the next thirty years the patient underwent a dozen distinct "cures" with baths and compressive bandages, and experienced a little improvement by reason of them. When Gussenbauer examined the patient there was an elephantiasis-like swelling extending from the middle of the arm *downward*, over which the skin was thickened, red, and in places studded with papillary excrescences; there was stiffness in the hand and elbow joints, also severe pains except when the limb was held in a pendent position. The extremity was in a condition to suggest the advisability of an amputation. After four days of continuous vertical suspension, under injections of morphine, the œdema was sensibly diminished. The firm adhesions in the sheaths of the tendons were now broken up by means of passive and later by active movements, and warm, wet poultices and massage were also employed. "In consequence of this treatment, the patient was in three weeks completely freed from pain, the swelling on the limb was removed, and the normal mobility of the joint restored. According to later reports of the case, the cure of the patient was this time a lasting one."

Massage possesses a similar influence upon œdemata* of all sorts, provided they originate from temporary causes. In the so-called passive inflammations, for instance, after protracted immobilization from bandaging, frictions and vigorous effleurage are of great service for the prevention of changes, due to "plastic" œdema, which might prove most momentous to the patient. When the cause of the œdema is more persistent, though not severe in its nature, massage may exercise a very mitigating influence, as, for instance, when long-continued vaso-motor disturbances exist, or there are slight obstructions, of one sort or another, to the circulation. By way of example, I refer to the case reported in the note on page 69, in which massage was resorted to in order to remove the results of stasis, which was due to a "compression-thrombus." It may be remarked that a mistake was made in this instance, in that the treatment was begun too early, *i. e.*, before the thrombus was fully organized, and consequently gave rise to an embolism.

The subcutaneous areolar tissue is sometimes the seat of chronic inflammatory processes which arise partly, "*per contiguitatem*," from similar processes in other parts (most frequently in the skin), and partly as primary affections. These *subcutaneous infiltrations*, being often very painful to the patient, deserve more attention from the clinical student than is usually accorded them. Their palpation is performed in the same manner as in myitis (p. 92). Their differential diagnosis, from similar processes in the muscles, is often not very easy. The important points to be noted, as regards subcutaneous infiltrations, are: their more superficial seat, and the non-impairment of the function of the muscles which lie beneath them. The treatment consists of effleurage and frictions.

Varix and Phlebitis.—Moderately developed varices, chronic phlebitis and periphlebitis may derive advantage from cautious effleurage treatment, which increases the oft-times restricted power of bodily movement, and removes the transient but painful cramps which affect the gastrocnemic muscles, especially

* When the cause of the œdema is continuously operative, as in certain affections of the heart, lungs, liver, and kidneys, massage is obviously of little worth. Nevertheless, according to the testimony of various physicians, who have used it in such cases, it has the power, at least in some cases, of ameliorating the condition of the patient, especially by diminishing the loss of functional power in the lower limbs, and in allowing some movements to take place which would otherwise be impossible.

at night. Fully developed varices and phleboliths, as has been mentioned (p. 69), constitute a contra-indication to massage.

Ulcus Cruris.—In crural ulcers two manipulations are made use of: (1) effleurage over the vessels on the central side of the lesion (and over the ulcers themselves, if they are small), for the sake of promoting local nutrition and thereby augmenting the power of healing; (2) vigorous frictions, in narrow circles, directly over the ulcer and near to it, in order to remove the surrounding infiltration. The sittings should take place several times a day. In this way very sluggish ulcers, which have long resisted other treatment, may be healed through massage, without employing any other therapeutical measure excepting the raised position for the affected members. From verbal accounts which I have received from trustworthy sources, I learn that an analogous state of things obtains in chronic eczema of the extremities.

Teleangiectasis.—Mezger has treated teleangiectasis in the skin with massage. His method is to press the abducent veins together with the fingers of one hand, so that the small vessels become distended with blood, whereupon, beginning at the periphery of the vascular structure, he crushes them with the thumb of the other hand. When the teleangiectasis spreads over the soft parts of the nose, Mezger puts an ivory stick inside the nostril in order to secure a firm basis for his frictions. There remains a hardening of the skin and subcutaneous tissue for some time after the treatment, but no new formation of vascular tissue takes place.

Cicatrices.—I have already mentioned the ability of massage to restrict the formation of scar-tissue. When cicatrization already exists, vigorous frictions applied successively to the superficial parts of the scar (only so much of the surface being manipulated at a time as can be covered by the thumb), are able to make it atrophy and grow thinner. Firmly exerted pressure may have similar effects. After extensive burns, and, in general, when extensive scars are present, massage is a valuable adjuvant of the usual treatment of such contractures, in that it makes the scar more elastic and so renders the task of gymnastic, orthopædic, and surgical therapy more easy. However, one must be prepared

to work assiduously, for what are frequently slight results, as all these cases are seldom very promising.

Dr. Hünerfauth, in his book upon massage, published in 1887, describes a case of contracture, resulting from a burn, treated by massage. I subjoin a condensed account of it, as its first part shows what massage can accomplish when it is persisted in.

A Parisian lady, who had her gloves on, was cleaning them with benzine. Coming too near to a light, she was severely burned on her hands and forearms. Nine months thereafter she applied to Dr. Hünerfauth for treatment. On the right forearm extensive scars were found, "the burn was a total one;" while on the left forearm, extensive radiating scars (very thick in places), with five narrow oases of uninjured skin between them, were to be seen. The movements of the hands were very limited; the muscles of the forearms were moderately atrophied, those of the hands very much so; the fingers were in the position of contracture, and the nails remained, but were deeply discolored. Massage, consisting of "pressings and kneadings," and gymnastics, *i. e.*, passive movements, were given twice a day, and electricity was administered once a day. In this way the scar-tissue was loosened from the tendons, the existing paræsthesia (sensation of cold) disappeared, the mobility in the joints increased, and the muscular atrophy diminished. This was, doubtless, a happy result for the French lady. It shows very well what may reasonably be expected of massage treatment in such cases, and we gladly cite it, on that account.

But Dr. Hünerfauth further speaks of a "regeneration of the skin" caused by massage, not only in the neighborhood of the sound skin, but also in the cicatrices themselves, which was well advanced at the end of seven weeks, when treatment was discontinued, and left little to wish for, inasmuch as cutaneous hairs, glandular orifices, and a generally normal state of the skin had begun to show itself. Dr. Hünerfauth remarks, with some self-esteem, that he has seen no mention of such an achievement of massage anywhere in its literature. We have not seen such, either, and take the liberty of citing this part of the description of the case as an example of what can never be expected of any kind of treatment in such cases. *Either* the skin was not burned through within the territory in question, and the corium and corpus papillare was not destroyed, so that no scar-tissue was formed therein, *or* else no real skin with glandular openings, etc., etc., was formed; for out of scar-tissue, excepting certain new formations, comes scar-tissue only, and a normal skin is not restored over wide areas of cicatrix, due to burns, by the surrounding sound skin. In this case, moreover, the burns on the right forearm were so complete as to leave no normal skin on it; yet this is the seat of the miracle which Dr. Hünerfauth will have it he beheld!

Frost-bite.—In conclusion, I remark that massage, by reason of its circulation-promoting and invigorating effects, ought to be a good remedy in cases of *frost-bite*. At any rate, it certainly has the power to prevent or minimize gangrene of the extremities, and that more effectively than the vertical suspension and aimless rubbing usually made use of. If I had a case of total frost-bite, I should treat it by means of vigorous and prolonged effleurage over all four extremities at once—at the hands, therefore, of four

persons; beginning the treatment in a cold room, I would combine stomach-kneading with the effleurage of the extremities, and employ the ordinary excitants at the same time. So far as I know, there are no reports of the effects of such procedures in cases of this nature.* But we have, as I think, every reason to suppose that this form of treatment would be better, in many respects, than that which has hitherto obtained.

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* Since the Swedish edition of this book was published, a case of *frost-bite* was treated, in the Seraphim Hospital, at Stockholm, in the manner suggested above. The result was better than could have been anticipated.

CHAPTER VII.

AFFECTIONS OF THE MUSCLES, TENDONS, SHEATHS OF THE TENDONS, BURSÆ MUCOSÆ, AND FASCIÆ.

I have specified (p. 54, *et. seq.*) the grounds for thinking that massage can counteract and remove muscular atrophy, and have shown (p. 78) how this attribute fits it to act in combination with gymnastics and orthopædics on the one hand, and on the other to mitigate the prejudicial effects of the last named method of treatment.

Massage, on account of these virtues, is more and more resorted to for the sake of preventing muscular atrophy in all cases where, for one reason or another, groups of muscles have been put to rest for a considerable time, provided there is no evident contra-indication to its use.

In well-developed atrophy of the muscles, massage has the power of counteracting the same, according as the ætiological factors are temporary or permanent. In atrophy due entirely to inactivity of the muscles, the latter recover their normal volume and functional power with astonishing rapidity even when gymnastics are not combined with the massage-treatment. Whenever it is possible, gymnastics and massage should be used together in the treatment of muscular atrophy. Massage has a favorable influence also upon muscular atrophy due to certain joint-troubles, arising after abscess in a muscle, or after severe traumatic injuries, or even after simple contusions. Recently massage has come into vogue, to some extent, as a remedy for the general muscular debility which arises during or follows some constitutional diseases, *e. g.*, in convalescence from infectious diseases, in chlorosis, anæmia, diabetes, chronic lead-poisoning, etc. It is likewise efficacious, though necessarily the results are not always of the most satisfactory nature, in cases where nervous disorders of a central, spinal, or peripheral nature affect the muscles. It can be employed, therefore, after traumatic injuries to or bleeding in the nervous system, in progressive muscular atrophy, in the rare pseudohypertrophy of the muscles ("*atrophia musculorum lipo-*

matosa"), after acute anterior poliomyelitis, and in other lesions of the spinal cord, after diphtheria, etc. In these cases it is often necessary to continue the treatment for years, and even then, in progressive diseases, it can only stop or delay the changes in the muscles.

Finally, as has been said, we avail ourselves of massage in order to strengthen the atrophic muscle in certain kinds of deformity. In this field it has no other aim, and is thrust completely into the background by the far more effective gymnastic, orthopædic, and constitutional treatment.*

In all cases of this sort, effleurage and tapotement are the more useful manipulations. Almost any one who has had any instruction, can give them.

Myitis.—The myitides, or myositides, if that term seem preferable, give the masseur much to do, especially those which have been very little understood, even by physicians,† until very recently, but which make up a large part of what the laity usually styles "rheumatism."

"Rheumatic" myitis occurs oftenest in the muscles of the neck or throat, and not infrequently in the glutæi, the muscles of the thorax, or of the extremities. But no muscle can be considered immune from these insidious inflammations of unknown origin, as they are found in the most protected places, where their presence is least to be expected.‡

We are all familiar with the oft-mentioned symptoms, which are variously designated, and for the most part given independent names, in pathology. A considerable number of neuralgias

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* On this account I do not permit myself, in this work, to enter upon the treatment of those deformities, in the description of which certain authors have thrust massage into the foreground without being able to say much for it (see Dr. Landerer's "Treatment of Scoliosis by means of Massage"). Especially with regard to the part of massage in the very variable treatment of habitual scoliosis, there is little more to be said than that the atrophic muscles should be massaged, and, most of all, those that are most atrophic, *i. e.*, those on the convex side of the curvature—not, as some authors say, on the concave side, where the muscles are less stretched and therefore thicker.

† The spread of a more accurate knowledge of chronic myitis, in Scandinavian countries, is chiefly due to Dr. Helleday's admirable article in the (*Nord. Med. Arkiv.*, 1876) *Northern Archives of Medicine*, 1876.

‡ Independent myitis has been recognized, on valid grounds, even in the Psoas major. Dr. J. Lundberg reports (in *Ups. Läkarf. Förh.*, 1887, Proceedings of the Society of Physicians in Upsala, 1887) a case in which the functional disturbance pointed to changes in this muscle. Inequalities in the muscle were palpated through the extraordinarily thin abdominal wall. Both the inequalities and the disease disappeared under massage-treatment.

(many of which certainly arise from other causes) depend upon myitis, taking their rise partly from the pressure of the swollen muscle upon the nerves which lie on or within its substance, partly from the inflammation passing *per contiguitatem* to the neurilemma. Thus myitis in the complexus and cucullaris muscles gives rise to occipital neuralgias; myitis in the corresponding muscles readily causes pain within the territory of the cervico-brachial or cervico-occipital nerves; myitis in the supinator longus may cause pains in the domain of the radial nerve; and a more or less complete counterfeit of a sciatica may be called forth in the neighborhood of the sciatic nerve, by myitis in the glutæi, in the pyriformis, or the musculature of the thigh.

The pains, whether localized within a muscle or in an extensive nerve area, are of an extremely changeful character; being now very sharp, as in lumbago ("back-shot"), which, usually, is due to myitis in the lumbar muscles, oftenest of all in the sacro-lumbalis; or dull and diffused, so that they rather resemble the sensation of fatigue, and correspond usually with the pains of anæmia and chlorosis. On palpation, changes are often clearly evident, which have escaped the patient's attention.

In some instances the diminution of ductility and lowered functional power * becomes strikingly clear. I would call attention to "torticollis-rheumatica," in myitis of the scaleni or sterno-cleido-mastoideus of one side; to the limping and otherwise disturbed gait, in myitis of the musculature of the leg; and to the disability for vigorous mechanical work in myitis of the arm-muscles. The last named often causes disturbances of function

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*Dr. Joseph Schreiber, of Aussee, in Meran (Austria) has made a highly interesting discovery regarding muscular infiltrations (see *Deutsche Medicinische Wochenschrift*, 1889, page 175). Where there is an infiltration in a muscle, the muscle loses a certain amount of its power—a certain number of kilogrammeters, says Dr. Schreiber. By a lengthy discussion, which seems to be purely "speculative," he reaches the following result: "The affected muscle will regain its functional power if the lost energy, 1000 kilogrammeters for instance, is restored to it by means of mechano-therapy, be it by means of manipulation or by means of medical gymnastics. The restoration is effected at a single sitting, if the 1000 kilogrammeters of lost power be communicated in the course of *one* sitting; in ten days, when 100 kilogrammeters a day are transferred to the muscle."

This is typically professional, mechano-therapeutical, shocking nonsense, under the guise of learned terms. A highly gifted German friend who called my attention to this wonderful utterance has suggested to me a very witty analogue to this last mathematical triumph of Dr. Schreiber, "How long will it take to go from Hattersheim to Frankfort with one horse? How long with two, three, or four horses? How many horses are required to bring one instantaneously to Frankfort?"

which have to be referred to the complex of symptoms known under the name of grapho-spasmus.*

However, these symptoms are of secondary importance, for the purpose of determining the seat of the inflammation in the muscle, if it can be done. Functional disturbances may have very various meanings, as we know. Spontaneous pains, in whose localization reflex, irradiation, and projection conditions play so important a part, have still less worth for diagnostic purposes. Pain on pressure, which is seldom wanting in the more acute cases, affords surer guidance in determining the seat and extent of a myitis. But the practiced masseur is usually able to recognize through palpation the changes caused by myitis in the consistency of the parenchyma of the muscle; and becomes more and more given to governing himself, in these as well as other cases, by the objective rather than the subjective symptoms.

Palpation of the muscles, which is one of the most frequently recurring and difficult tasks of the masseur, demands above everything else an accurate knowledge of the normal characteristics of every single muscle. When this is once acquired, through sufficient practice, one can readily recognize palpable changes in the tissues, which are often apparently insignificant in comparison with the subjective troubles of the patient. The examination is best made thus: after well kneading the skin over the muscle with fat, the masseur lets the tips of his middle three fingers glide over the skin above the *uncontracted* muscle, both in the direction of the long axis of the muscle-fibres, and perpendicularly to it, accommodating meanwhile the pressure he exerts to the thickness of the tissues covering the muscle. In examining muscles which are accessible for such a manipulation, one gains fuller information as to the character of the muscular tissue, if he raises it between his fingers and subjects it to a "searching" kneading, similar to pétrissage.

In recent myitis, where one must presume that the affected portion of muscle is permeated by a serous exudation, it will be found that this section gives the sensation of diminished elasticity,

* Myitis and neuritis often lie at the basis of the symptoms of grapho-spasm. But in some cases of this nature, to whose consideration I shall recur, no changes in the arm can be established. I have had many opportunities of satisfying myself of this fact by accurate examinations.

of a more "doughy" consistency, and of a soft swelling. Where the inflammatory process has attained full age, and where the inter-fibrillar connective-tissue has become considerably augmented, then the consistence of the part thus changed is harder than that of normal, uncontracted muscular-substance. Sometimes one finds small indurations scattered throughout the otherwise soft substance of the muscle. These are most readily and most frequently found in the broad, flat muscles.

Myites frequently give rise to mistakes in diagnosis; both by reason of their being mistaken for other affections, and because other affections are mistaken for them. A beginner in palpation may easily be led astray by infiltrations in the skin and subcutaneous tissue, or by thickenings in the fasciæ, or by structures that are wholly normal, such as lobules in the subcutaneous fatty-tissue, or differences of consistence which proceed from the underlying parts, or are conditioned on the form of the muscle istelf. In the great majority of cases, certainly, myitic swellings are, as regards their consistence, by far less sharply defined, from the surrounding tissues, than are new formations of any other kind whatever. All the same, I have seen gummata taken for myites. The myitic pains, which, as has been remarked, have an extremely variable character, cannot be distinguished from those belonging to "pure" neuralgias or general neuroses; or those which accompany chlorosis, anæmia, gout, poisoning of various sorts, but especially lead-poisoning, or trichinosis, or those which are due to other local processes. How frequently slight pleurisies are held to be "intercostal-rheumatism," and how frequently slight myites in the chest-muscles are taken for pleuritis! The sensibility to pain on pressure may also lead to frequent errors. Painful myites in the anterior abdominal wall, which are not always easily to be distinguished from processes within the abdominal cavity, may give rise to very singular mistakes. I have, for instance, known such a myitis to suggest the diagnosis of perityphlitis, and *vice versa*. I subjoin the account of a case—Case 3, below—because I remember that the description by the patient of her ailment led me to think first of a gastric-ulcer, which may seem quite natural to the reader. In these, and many other cases, accurate palpation alone can save one from serious mistakes, which without doubt are common enough. Myitis in the neighborhood of a joint, *e.g.*, the shoulder

or hip-joint, may stimulate processes within the joint itself. I know cases in which myites were mistaken for coxitis; and not long ago a colleague, who is rightly held in high esteem by others as well as myself, informed me that he had once treated a genuine coxitis with massage, thinking it to be a myogenic-sciatica.

So much for the difficulties of differential diagnosis, which are of very common occurrence, and concerning which we cannot expatiate here *in extenso*. I cite the following cases as examples of rheumatic myitis:—

No. 1.—W. B., Forty years old, a naval officer, had for several months suffered from pains on both sides of the neck, though especially on the right side. The pains radiated, from various points, upward over the back and crown of the head; they were aggravated by changes of weather, which also caused some limitation of the movements of the head. On examination (February, 1885), evident differences and indurations were found in the upper parts of the cucullaris muscle on both sides. The patient received massage, daily, for three weeks, at the end of which time he was completely restored to health (an extremely usual case).

I have recently heard, *i. e.*, in the autumn of 1888, that he begins to feel his old trouble returning (an equally extremely usual case).

No. 2.—M. R., superintendent of a manufactory, about forty-three years old, has had, for something over a month (October, 1885), a feeling of fatigue and pain in his right forearm, which he is not able to localize accurately, nor has he full use of his arm. The patient, for some days, has had massage to no purpose, in the upper edge of the cucullaris muscle, where we can certainly feel some old infiltrations, which have nothing to do, as I think, with his present trouble. On making an accurate examination of the arm, I feel in the upper part of the supinator longus muscle, the soft, doughy swelling, which is unusually palpable, of a recent myitis. At the same point there is evident pain on pressure. The patient had vigorous effleurage for a quarter of an hour, immediately after which he felt a striking diminution of his trouble, which completely ceased, after six further sittings, on as many days.

No. 3.—Miss I. W., twenty-three years old, pale and anæmic, presents herself, 3, 11, 1887, at the Stockholm Polyclinic for Gastric and Intestinal Diseases. She complains of a pain, of over a year's standing, in a circumscribed spot, and points to the gastric region a little to the left of the median line. The pains are constant, but grow worse after a meal. For the rest, there are slight symptoms of dyspepsia. On examination, palpation discloses a definite difference in the consistence of the upper parts of the abdominis recti muscles; the left being infiltrated and harder. Under careful sidewise pressure against the latter, the patient feels sharp pains, that evidently have their seat within the muscle. When she attempts to raise herself, without help of her hands, a more intense pain is felt in the place alluded to. For a couple of weeks the patient had one massage-sitting daily, during which her inveterate pains quickly diminished, and at the end of ten days entirely ceased. When I chanced to see the patient again, some two months later, she had had no reminder of her old affection.

No. 4.—Dr. Th. Gies, of Rostock, reports a case (*Deutsche Zeitschrift für Chirurgie*, 1878), of a healthy merchant, forty-eight years old, who suffered for several weeks from rheumatic pains in his right leg, which, on examination, disclosed a swelling of the soft parts in the whole circuit of the lower half of the thigh, making it impossible

for him to bend the knee. The skin, even, was œdematously infiltrated. Osteomyelitis and periostitis were suspected, but an exploratory incision being made the muscles were found to be changed à la Froriep's "rheumatic-induration." When, after a few weeks, the wound from the incision was healed, the man was treated with massage, warm baths, and douches. After seven and one-half weeks of such treatment, which included a total of forty massage-sittings, the patient was completely restored to health.

No. 5.—Helleday (*l. c.*), reports: B. I., five years old, from Stockholm, was received for treatment, 29, II, 1876. A little more than two months previously, the patient had begun to complain of pain in the right hip and knee, which was sometimes moderate and sometimes so acute that he cried aloud and refused to walk. As he referred the pain chiefly to the region of the hip-joint; as there was also considerable pain in the groin, and the gait had become halting; a beginning-coxitis was feared, and the application of permanent extension was talked of. Both the hip- and knee-joints were, however, entirely free. About the hip the glutæus medius muscle was swollen, particularly so near to its origin; so were the quadratus femoris and sartorious muscles, and the flexors of the thigh as well. These muscles were not very hard from infiltration, but did give a decided sensation of diminished elasticity. Only the glutæus medius and the upper part of the sartorius showed marked painfulness. The gait, even on the days the patient did not complain of pain, had a peculiar character. At the moment the right limb was called on to bear the weight of the body it sprang backward, with a jerk, to the maximum of extension, instead of passing gradually to the position of extension. This anomaly, as well as the sensitiveness and pains, completely disappeared in the course of twenty-five days' massage-treatment of the affected muscles.

No. 6.—Henschen reports (Skrifvarekrampen's Patogenes = Pathogenesis of Writers' Cramp, Upsala Läkare för. Förh., XXIII; Proceedings of Upsala Association of Physicians, XXIII) the following case, which I cite here, because of its contributing to a better understanding of pathologico-anatomical changes: Bookkeeper Pettersen had a typical form of grapho-spasm. He was fifty-six years old, and, as bookkeeper all his life, had been chiefly occupied with writing in the counting-room during most of the day, thus supporting himself and his family. Ten years ago the first signs of writers' cramp showed themselves; which being recently much more pronounced caused him to consult a physician. At the present time he can write but a few words, which have the appearance common in such cases. The letters were written by a trembling hand. When the patient's arm and chest are exposed, one can perceive with satisfactory accuracy the causes of his defective script.

As soon as the patient takes up his pen and would begin to write—we observe that the pen-holder is spasmodically seized by the thumb and forefinger and pressed against the paper, from which frequently it cannot be removed without much difficulty. At the moment the patient tries to write the hand and pen are thrown into an oscillatory movement of pronation and supination, and a flexion takes place at the wrist at the same time. Simultaneously a clonic-spasm is observable in the supinator longus, whose contractions on the outside of the arm are quite noticeable, and there are tremors in the pronator teres. By encircling the patient's arm with the hand, "in the thumb-grip," one can plainly feel these movements, and ascertain moreover that the flexors, especially the flexor carpi radialis, and the extensors, especially those of the thumb and forefinger, participate in the clonic-spasms, though in no very marked degree.

The muscles of the upper-arm, meanwhile, are quiet and not tense. On the other hand the pectoralis major is set into a lively muscle-play which shows itself externally

in the skin. Closer investigation shows that the hinder portion of the deltoid participates in the cramp. Such, in brief, were the general conditions of the case.

In the local examination which followed, by means of careful palpation and proper comparison of the muscles of the right arm with those of the left, the following points were observed:—

The adductor pollicis muscle of the right hand was acutely painful and at the same time swollen and thickened to a high degree, and gave that peculiar feeling of resistance, which to the expert masseur so surely betokens the most characteristic symptom of a diseased muscle. The interosseous dorsalis primus muscle was painful and swollen, chiefly at its under, peripheral end. The interosseous dorsalis secundus was slightly painful at a corresponding point; but there was next to nothing observable as to the other two interosseii. The thenar muscles were slightly painful.

On the arm, the supinator longus, which is also swollen, is more painful than the others, along the whole belly of the muscle. Similarly the two extensor carpi radialis muscles are painful; and in addition we find a cord-like induration upon them and the extensor communis also. Upon the extensor-side, the origins of the extensors of the thumb and forefinger are sensitive and present an abnormal feeling of resistance.

Upon the flexor-side painfulness and induration showed themselves in the angle between the supinator longus and the pronator teres (supinator brevis).

The origins of the supinator longus and extensor carpi radialis longus are noticeably sensitive; and there is moderate pain along the course of the brachial nerves; and a painful induration along the lower border of the under edge of the deltoid muscle.

The whole of the pectoralis major shows painful and swollen spots along the course of its muscular fibres; and there is some painfulness in the lower portion of the deltoid also.

Traumatic myites are very common upon the extremities and the buttocks, and fall with some frequency to the lot of the masseur for treatment, though far less often than do the rheumatic myites. The diagnosis is easy, since the history of the case gives a good clue, and as the palpation-phenomena are frequently very distinct, the inflamed muscles, in spite of their equally inflamed coverings, are perceptibly hard and inelastic to the feel, and are sharply marked off from the surrounding muscular tissue. In other, lighter cases, the examination will certainly involve more difficulty, and must be made with great care, in the manner described on p. 93, in speaking of rheumatic myites. If the case presents itself for treatment soon after the injury has been received, the practitioner himself, is frequently astonished by the rapidity with which the objective and subjective symptoms vanish under effleurage and light frictions. It is important that treatment be continued till complete restitution is gained; otherwise slight chronic myites remain which gradually cause extensive induration of the muscular substance, and call for tedious labor with frictions, etc., before they finally disappear.

CASE 1.—C. J. L., a factory hand, aged 25, was struck (January 21, 1887) by a round piece of wood on the right forearm and became unable to work, and finally sought my help; nine days after the injury, I found slight discoloration in the upper part of the radial side of the forearm. On palpation, I felt a broad, well-defined swelling (hæmatoma), as hard as cartilage, situated under the fascia and in the superficial part of the supinator longus. It was 7 centimeters long and about 3 centimeters broad. Near to the swelling, both the supinatur longus and extensor carpi radialis longus were felt to be hard and inelastic. (A traumatic myitis, with some hæmorrhagic infiltrations, perhaps.) Tolerably vigorous effleurage-strokings were made over the whole segment of the limb, and frictions over the hæmatoma, beginning on the central side in each case. After six days, and as many sittings, there was no trace of the hæmatoma left, and scarcely anything remaining of the other changes; the arm did unhindered good service, and the patient ceased to be treated.

CASE 2.—M. W. N., 37 years old, laborer, seeks help on October 9, 1886, because he has experienced pain in walking since he had a fall on his left buttock, more than a year since. It is obvious that he walks with difficulty. The whole upper part of the glutæus maximus muscle, together with its subcutaneous tissue, is felt to be much infiltrated; it is also the case, though to a less degree, with the palpable portion of the glutæus medius muscle. There is complete mobility at the hip joint. The patient has a thorough-going massage-sitting, with frictions, daily, and daily states that he feels distinctly better. The infiltrations also are perceptibly diminished, but are still palpable, when the patient, before the expiration of a month, declares that he is completely restored and breaks off the treatment.

This is an appropriate place to call attention to the stretchings and, as it would seem, even partial ruptures which sometimes arise from energetic extension-movements, either active or passive, and cause not infrequently a very painful myitis, which is seemingly insignificant compared with the original extension-movement. These myites are distinguishable from "rheumatic" muscular affections, so far as the masseur is concerned, only by their history.

I note, likewise, the complete subcutaneous ruptures of muscles or tendons which may often arise without any external injury to the skin, but are usually caused by the violent contraction of the muscles themselves. Such occur most frequently in the tendo-Achillis, the extensor quadriceps femoris, the triceps and biceps brachii, the deltoid, and the rectus abdominis. Such cases, even, fall properly within the domain of massage, which can prevent or remove, according to the rules given above, the conditions, which are often very trying to the patient. Diagnosis in recent cases is easy, ordinarily, partly through the hints which the history of the case affords, partly through the gap, filled with blood, between the fragments of the

muscle, which palpation discloses. In older cases the nature of the affection is not always so evident.

Miss M. G. X., 20 years old, in dismounting from her horse (June, 1884) more quickly than she intended, made a violent effort not to fall backward, felt immediately "something give way in her stomach," fell, and, owing to the excessive pain when she attempted to move, was unable to rise. She kept her bed for awhile, but had no medical treatment. Since then she has always had pains and felt something like a lump in her stomach, chiefly when riding or taking long walks. Miss X. came under my care, for another internal affection, at Carlsbad, and was examined 2, VII, 1888. Thereupon I found by careful palpation a plainly perceptible induration, a few centimeters below the navel, in the right rectus abdominis muscle. There was some sensitiveness to pressure, and when the patient tried to raise herself from the reclining posture without the help of her hands an intense pain was felt. In the course of forty-three days the patient was treated by means of frictions at thirty-nine sittings, at the end of which the palpable changes and the subjective troubles had disappeared. Of the latter she still has reminders, if she makes great exertion, though they are comparatively slight.

There is not much to say concerning the technique involved in the treatment of muscular inflammations. We resort to effleurage in the wholly recent cases, and to frictions which are forcible in proportion to the age of the changes. Where the muscles are accessible for pétrissage that manipulation is used.

Fresh myites frequently require but a few days' massage; inveterate processes may tax the masseur's powers for months; extensive indurations sometimes defy all *treatment*.* One ought always, if he can, to continue the treatment till the palpable changes are entirely removed.

It is sometimes worth while to employ gymnastics during or after the massage-treatment in cases of old myites. Warm, wet compresses doubtless hasten restitution in such cases. In very extensive, inveterate myites warm, full mud-baths (37.5° to 38° C.), with or without massage, are of great service.

Tendo-vaginitis crepitans is now generally treated with massage (where its use is understood), which has completely driven tincture of iodine and gray-ointment out of this field. Under frictions and effleurage the symptoms usually vanish in a few

* I have not included above the "specific" myitis, which syphilitic patients sometimes present. They cannot be distinguished, by palpation, from those of a rheumatic nature, and stubbornly resist an exclusive massage-treatment. Some time since I treated a patient by means of massage for quite a while, but in vain. Finally, I subjected the patient, who had a light case of syphilis some years before, to a tolerably vigorous course of anti-syphilitic medication, during which the myitis disappeared.

days or a couple of weeks. If one prefers to employ some other means in addition to massage, warm, wet compresses may be used simultaneously.

Dropsy of the Tendinal Sheaths likewise falls within the scope of massage. But even when no tuberculous ætiological factor can be discerned, one ought not to indulge great hopes of a cure through an exclusively mechanical-treatment.

The last case which I have treated with massage was that of a farmer from Roslagen, who had considerable effusion in the extensor-tendinal sheaths of both hands. At first I massaged them for a short time with energetic frictions and effleurage, but without result. So I punctured them, expressed the serous contents and the *corpora oryzoidea*, compressed and massaged them with my full force—all to no purpose; the sheaths of the tendons immediately filled up again. Then I injected tincture of iodine, diluted with an equal volume of water, and massaged again. When all was in vain, I gave up the case.

My honored friend, Dr. Evald Johnsen, in Copenhagen, had six such cases; five were cured and one was improved. In one of these cases, which was comparable to mine just mentioned, he employed 153 sittings! I shall never become so perservering in the use of massage, since I have conceived a distaste for treating this affection by such means. In comparison to it, dropsy of the knee itself calls for less patience on the part of the masseur.

Tendo-synovitis, when it is obviously of a tuberculous nature, belongs to the domain of surgery.

Chronic Inflammation of Fasciæ.—Chronic inflammatory processes in the fasciæ are most certainly more general than is supposed, and may very often complicate the myites. Nevertheless, they are seldom treated with massage on their own account, although it might surely do good service, in moderately recent cases, and counteract shrinking, through its power of cleansing the fasciæ from the products of inflammation and of arresting the course of the latter. It is, properly speaking, the well-known, so-called Dupuytren's contracture, or shrinking of the fascia palmaris, whose treatment by massage has become recognized on account of the good results set forth in Billroth's Handbook, which results were achieved by Dr. Barbieri, a prominent practitioner in Vienna, in the middle of the seventies. Nevertheless, it requires a good deal of enterprise to undertake the treatment of cases of this description, be they never so little developed, for one must be prepared to do a deal of work with massage by means of energetic frictions, supplemented by gymnastic and

orthopædic treatment, for the sake of slow and rarely satisfactory results.

Hydrops in Bursæ Mucosæ.—Hygromata, also, have been treated by massage, which here (in agreement with what has been accomplished by Mosetig-Moorhof in the Wieden Hospital) may be most advantageously employed as an after-treatment, following such procedures as puncture and antiseptic washing out, or compression, as with Heine's sponge. The few attempts which I have made to treat præpatellar-hygromata exclusively by means of massage have been unsuccessful.

CHAPTER VIII.

AFFECTIONS OF THE PERIPHERAL NERVES.

Massage of the nerves * has gained in the last few years a much wider recognition than it formerly enjoyed; while its effects, which have been known for a long time, have been to some extent elucidated. The latter has come to pass for the reason that physical examination discloses pathologico-anatomical changes in situations where previously we had to content ourselves with simply noting symptoms, and with giving the disease, whose origin was entirely unknown, a name which denoted either a sensory or motor disorder.

Thus we have already pointed out above how frequently rheumatic myitis may occasion disturbance in the functional activity of nerves, through the pressure excited by the swollen muscular substance upon the nerve-trunks or through the invasion of the same by the inflammatory process. If such disorders are frequently of myogenic-origin, it is clear, on the other hand, that observations have accumulated which show that the peripheral nerves are themselves, not infrequently, the seat of primary lesions. Even in this field various diseases that used to masquerade under different names have been obliged to yield a part of their territory to undisguised neuritis and perineuritis.

Our actual progress thus far made is very moderate in amount, however. The future of nerve-massage is still shrouded in dark uncertainty, and at its present stage of development it is utterly impossible to define its limits. For the present, we must rest content with establishing its great importance in certain cases, and in not denying its possible but hitherto unexplained value in other cases.

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* Nerve-massage found mention in the scientific world at least as early as 1758, when Fordice, in speaking of hemicrania, wrote, " Compressio vel frictio nervi, qui cranium supra oculi orbitam perforat, aliquando dolorem lenit, numquam delet." Cotunni, also, speaks of massage in sciatica, but does no more than mention its influence upon the accompanying atrophy and disturbance of function (Henschen). Balfour employed nerve-massage in Edinburgh during the second and third decades of the present century. Many more historical notices in this connection are to be found.

For the present we must hold to the point of view just mentioned with regard to the disorders which depend on central nervous lesions, as well as those due to infections, intoxications, and other common causes. I shall return again to the little we really know concerning the value of massage in these cases.

In this chapter I shall confine myself exclusively, or almost exclusively, to disorders of the peripheral nerves. Of these as a whole it may be said: that massage promises the best results in those cases where palpation discloses objective changes; that this form of treatment, even when it removes objective changes, does not always afford the expected relief, since the symptoms may continue by reason of other lesions that are inaccessible; and, lastly, that occasionally one attains his end with surprising rapidity, even in cases where the most careful palpation does not afford the least information.

I allow myself, in passing, to remark that we may from this draw two important conclusions, namely: (1) that we are always justified in attempting to treat disorders of the peripheral nerves by means of massage, unless it is clearly contraindicated; (2) that under no circumstances are we justified in making a positive prognosis as to the result of such treatment.

Meanwhile it is proper to give a somewhat complete description of the technique of nerve-massage, which, for reasons of a practical nature, belongs here rather than in the second chapter of this work.

The three manipulations which belong here are effleurage, frictions, and tapotement. There is little to add to what has been said already concerning effleurage. In nerve-massage it owes its chief importance to its power to promote the circulation in the blood and lymph-vessels of the nerves; and to other effects similar to those detailed in the third chapter, as well as in the discussion of traumata, p. 81. In these cases it is also made centripetally over comparatively extensive surfaces. It is never necessary in nerve-effleurage to hit the nerves precisely and to determine their position accurately. Frictions, in so far as we mean the manipulations described on p. 37, whose peculiar purpose is to remove inflammatory products, are likewise to be performed in the ordinary way, observing, however, the invariable rule that they should begin, when it is possible, on the side nearer to the centre of the circulatory system. That they may

be effective, careful palpation is often necessary, and so is an accurate determination of the seat of the most insignificant changes.

In order to excite the nerves mechanically, use is made partly of typical tapotement with the percussion hammer, with the finger-tips, or even the fist (when the sciatic nerve is in question), and partly of certain manipulations which certainly differ in their external features from tapotement, but which, by reason of their sudden jarring effect upon the nerves, exert the same physiological effects as tapotement. Thus various Scandinavian gymnasts make use of a particular form of manipulation ("nerve-pressure" —"nerve-friction") which consists in placing the tips of the forefinger and thumb together (the nails of both being cut short), and pressing against the patient's skin in such wise that the groove between the tips comes just over the nerve trunk, which is then excited by means of rubs, of slight amplitude, made perpendicularly to the long axis of the nerve, over a longer or shorter section of the nerve, as the case may be. I saw very recently Dr. Wide, a Swedish colleague, in a case of amyotrophic lateral sclerosis, excite the radial nerve at the point where it emerges below the inter-muscular ligament of the upper arm by means of small "picking" movements of the forefinger, and thereby call forth slight extension movements in the patient's fingers. Others, placing the tip of the forefinger over the nerve, make a peculiar vibratory movement with the forearm, and in this way excite the nerve. This seems to me a very harmless procedure. We must not forget Dr. Granville's electrical instrument for giving nerve vibrations (see p. 35). That physician states that, through its use, he has achieved extraordinarily good results.*

In using tapotement it is necessary to know accurately the position of the nerve. In certain cases this is, on anatomical

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* Since I am desirous to give every man his due, I will not deny that Dr. Granville's instrument (which I have never seen and probably never shall see), is a very excellent one. Though I may not disallow Dr. Granville's great merit as an inventor and constructor, I may still venture to say regarding his views as a man of science, that the only merit which they possess, for many, is their originality. Among other opinions published by Dr. Granville (see *British Medical Journal*, September, 1882), is this: "Venereal tabes dorsalis is an inflammation which mounts from the penis, along the course of its nerves *per continuitatem*, to the spinal cord." I introduce it here only for the sake of affording the reader a pleasant variety in the monotonous course of this otherwise "dry" chapter, and to excuse myself for saying nothing, for the present, of Dr. Granville's achievements in the science of mechano therapy, beyond my mention of his instrument.

grounds, very easy. It is a trifling matter, for instance, to reach the different branches of the trigeminus at the foramina, where they emerge to spread over the face, or to determine precisely the place where the facial nerve emerges below the ear, or where the sciatic leaves the pelvis, etc. But in all these cases, it is not our custom to search for or to feel the nerve directly when palpating.

He who undertakes to treat disorders of the peripheral nerves with massage can, undoubtedly, by means of palpation, make a direct examination of the nerves and the changes which they present in some cases, especially when the nerves of the head, and above all the supraorbitals, are concerned. Alterations in the nerves may be recognized very frequently by means of palpation; for instance, at Valleix's "painful points," so common in neuralgic cases, it is possible, at times, to recognize small swellings with certainty.* Moreover it happens rather frequently, as we shall have occasion to notice, that inflammatory enlargements of the nerve trunks are plainly perceptible. In examinations of this sort, one most easily attains his object, if, having first rubbed the skin well with fat, he lets his finger-tips glide backward and forward over the nerve-trunks transversely to their longitudinal axis, and compares accurately the sensation due to palpation of the suspected nerve with the sensation produced by palpation of the corresponding nerve on the other, and supposably healthy side. If one succeeds, by such measures, in changing his rather vague diagnosis of "supraorbital neuralgia" or "facial cramp," to the more satisfactory one of "supraorbital or facial neuritis," then in his employment of massage he will work most with frictions on the parts which are found to be changed. But one must not omit to treat the nerve by means of the various manipulations, even in those parts where palpation yields only negative evidence.

But some one asks what shall I do in the very large number of cases where it is impossible to establish the existence of palpable alterations? To this I must give an answer which is deduced from what has been said already, and is a more satisfactory

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* I shall not concern myself here with the various views as to the pathologico-anatomical nature of the swellings in question, which, as Erb has emphatically said, may be variable, though they may well, for the most part, consist of inflammatory thickenings in and around the neurilemma.

reply than would appear at first sight, viz: I would massage the nerve in quite the same way as I should if I had found palpable alterations in it. In justification of this opinion, which will doubtless strike many as an extraordinary one, I adduce two facts which are as important as they are fully established: (1) that pathological changes often exist, where palpation, by reason of its incompleteness and the anatomical difficulties in its way, yields no information; and (2) that massage frequently achieves the most admirable results, even when subjective symptoms alone exist. In such cases, then, I make effleurage over the entire region; and make frictions over most of the nerves, *especially at the places which are usually the seat of palpable alterations*, and seek by these means, as well as by making moderately energetic tapotement over a still wider area, to "change the tune."

We have now gone over the general relations of massage to disorders of the peripheral nerves. I come next to the use of massage in some special forms of disease, from among which I choose as examples supraorbital neuralgia, *i. e.*, neuritis, or migraine, facial neuritis, and sciatica, as it is not needful or appropriate to discuss the whole class in detail. Traumatic affections of the peripheral nerves deserve to be treated of briefly in a special section.

Supraorbital Neuralgia and Migraine.—Supraorbital neuralgia or supraorbital neuritis, with or without symptoms of migraine,* is that form of nerve-affection which most frequently presents "palpation-phenomena," which must be referred to briefly here. Thus, in an examination made in the manner described above (p. 105) which must always be made with the utmost care, one finds a slight swelling just over the point where the nerve emerges from the supraorbital-foramen; as well as tender spots, with or without palpable alterations, which may

* I class supraorbital neuralgia and migraine together, as most English, American, and French physicians are accustomed to do. The Germans, as is well known, for the most part hold to a different view, since Du Bois Reymond, in 1860, explained migraine as a primary vaso-motor neurosis. Professor Henschen, who has carefully analyzed one hundred and forty cases, declares and shows at length, in his admirable work (Studier öfver hufvudet's neuralgier; Studies on Neuralgia of the Head, Upsala, 1881), that it is impossible to separate the different forms from one another, which Scandinavian as well as other Teutonic writers are likely to class together in the future. For my own part, I think that just those who are wont to treat these affections by means of massage, and are therefore accustomed to assign palpation the principal rôle in their examination, should be least inclined to assign an independent place to those forms in which vaso-motor and oculo-pupillary symptoms occupy the foreground.

occur at other points along the course of the nerve. The individual nerve-trunks usually feel enlarged to the touch in the neighborhood of the supraorbital-foramen, and we may find painful swellings, resembling cords, which in rare cases may be visible as minute flat ridges, indicating the situation of the nerve in the forehead.

The rule holds good in all examinations, when supraorbital-neuralgia is suspected, that one should examine not only the nerve in question, but also the other superficial nerves of the head quite as much. Supraorbital neuralgias, exceedingly often are due to rheumatic* influences that have made themselves felt in other nerves, which are usually the occipital and auriculo-temporal. Although changes in these latter are less palpable, by reason of their anatomical relations, than in the supraorbital, these nerve-trunks are often very painful, and require that the treatment be extended to them. Both lower branches of the trigeminus and their subdivisions ought also to be examined, though they are less liable to be affected than the nerves just mentioned. Furthermore, parts other than the nerves should be included in the examinations. One must determine whether the skin, as is frequently the case after protracted processes, is œdematous and thickened; this is best accomplished by raising a fold and comparing its condition with that of a corresponding fold on the other side of the body. The adjacent muscles should be examined likewise, to see if they contain infiltrations. Finally, one should ascertain whether there is any soreness to the touch over either of the upper two sympathetic-ganglia, on the same side of the neck. If such be the case, moderately vigorous frictions should be made over the place.†

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* In 106 of Henschen's 140 cases of migraine, rheumatic symptoms occurred in other parts of the body besides the head; in three cases such symptoms were not to be found; and in the remaining 31 cases such symptoms were, at least, not noted. Henschen rightly lays stress upon the fact that supraorbital neuralgias are much more frequently combined with neuralgia of the occipital nerves than with neuralgia of the two lower branches of the trigeminus; and claims on this ground that the peripheral extension of the malady through chronic inflammatory processes of a rheumatic nature is more common than the occurrence of neuralgia due to irradiation. Whether Henschen's opinion, that the trophic changes in the skin result in no case from the vaso-motor disturbances due to the attacks of migraine, is equally correct, I do not venture to decide.

† Henschen in his book, above mentioned, points out that sensitiveness to pressure over the cervical-ganglia is quite common in supraorbital neuralgia, and found it present in 91 out of 112 cases of the same. Professor Rossander reported (September 28, 1884,) in the Association of Swedish Physicians, on several cases of multiple neuralgia in which

After the foregoing remarks, not much need be added regarding the massage of supraorbital neuritis or neuralgia. The parts shown by examination to be changed from the normal are first of all the ones to be massaged; the nerve-trunks by means of the three manipulations already described, and the other parts (muscles, skin, and subcutaneous tissue), by friction and effleurage. When no palpable alterations are found, according to the rule given, one should proceed as if such had been found, always expending most labor on the places where their occurrence is most usual, *i. e.*, in the neighborhood of the supraorbital-foramen.* It need hardly be said that effleurage ought always to be made in the direction of the venous blood-flow (of the frontal vein), *i. e.*, from the frontal and temporal regions toward the root of the nose. I mention this simply because I have frequently seen masseurs proceed in the contrary order in such cases.

Massage should here, as always, go hand in hand with other remedial measures, especially with electricity, which so often is effective in neuralgias. Not even when palpable changes, due to inflammation, present themselves, should we neglect to use measures against the concomitant disorders, which in and of themselves may give occasion to neuralgia, and surely can exert an influence upon it. Nervous diseases of a general nature, anæmia, digestive troubles, etc., should be counteracted by the usual means of treatment.

Massage in these, as in other affections of the peripheral nerves, is, to say the least, one of our most powerful means of treatment, and a large percentage of inveterate cases are permanently benefited by it. The treatment, nevertheless, is frequently a protracted one. It usually requires several weeks, and not seldom months.

Henschen obtained improvement, or cure, in twenty-four out of twenty-nine cases; three cases showed no change, in two the result was unknown. As I have no interesting case on hand to serve as an illustration of the treatment by massage of nerves

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similar tenderness on pressure was observed, and where massage over the ganglia had been employed with good effect. The day after his paper, I sent him one of my massage-patients "to look at," who would serve as an analogue of his own. The case was that of an hysterical female, somewhat over twenty years old. My massage-treatment yielded no positive result.

* In two severe cases in which no palpable changes were found, by way of experiment I performed very vigorous frictions over the incisura-supraorbitalis, and succeeded in "cutting short" the neuralgia. In one of the two cases, which I chanced to see again, freedom from pain lasted for several weeks, at least, after the sitting. When I repeated the experiment in a third case, I only produced a violent attack of migraine, therefore I made no further use of the method, which may, however, be of some service in such cases as do not present pronounced migraine-symptoms.

of the head, I cite two particularly instructive cases of Henschen's, the first being a case of supraorbital neuritis, the second one of neuritis of the facial nerve.

Miss E. L., eighteen years old, has suffered since her ninth or tenth year, from severe headaches, whose original cause is unknown. None of her relatives have such an affection. The headache appears frequently every second or third day; sometimes, also, at intervals of several days. It usually begins in the afternoon. It is occasioned by reading or loss of sleep, and is the same summer and winter. The pains are of extraordinary violence; are seated on the left side of the forehead and left temple, and are frequently accompanied by an angina, in which the left tonsil almost exclusively swells. Occasionally the headache is accompanied by nausea only. The patient has simultaneous pain and twitches in the left eye.

The patient, who is of diminutive stature, is otherwise in good health. There are no symptoms of disorder, either as regards the stomach or the sexual organs.

The skin of the forehead, on the left side, is thicker than that on the right side, constituting a pretty sharply defined area in which a few insignificant ridges in the course of the supraorbital nerve are visible. The mobility of the skin on both sides is practically equal. During the headaches the patient feels that the left half of the forehead is more tense. The supraorbital nerves on the left side are sharply and clearly to be felt; on the right side only vaguely so or not at all. In the angle of the left eye a painful, string-shaped induration presents itself. The soft parts of the left temple are swollen and doughy. The skin in the region of the left parotid gland is thickened and sensitive—the same is true of the upper attachment of the sterno-cleidomastoideus; no changes of the kind on the right side, where the muscle named is more sharply defined. There is pain on pressure on the crown of the head, and also over the upper part of the left cervical sympathetic, light kneading of which gives rise to nausea; not so on the right side. The spinous processes of the upper cervical vertebræ are tender to the touch. The entire hinder wall of the pharynx is covered with granulations, and like the tonsils, which are not swollen, is exceedingly flushed in color. Prescription: Massage.—The treatment was continued about one month; at first daily, later, twice a week. Although the patient continued uninterruptedly with her school work, she improved so much that at the end of this time she thought she could discontinue all treatment. She remained quite well for several months succeeding her treatment, or as long as I had an opportunity to observe her.

In order to illustrate the massage treatment of a rheumatic *facial neuritis* with palpable thickening of the nerve, I append the following account of an interesting case of Henschen's. Upsala Läkaref. Förh., XXIII.—Proceedings of the Upsala Physicians' Assoc., XXIII.

M. Nilsson, school-mistress, 27 years old, has been troubled by frequent headaches since childhood, which usually terminate with vomiting, after which she feels well again. In 1876 she had a fainting fit, attended by convulsions, and, as she says, with loss of consciousness. In the spring of 1882 she was very weak and suffered from giddiness and fainting, especially when she stood upright. The attacks were unaccompanied by convulsions, but sometimes by nausea and a feeling of suffocation. These attacks recurred last fall, *i. e.*, in 1884. Twitching began in the left eyelid in August, 1883. It was continuous and uninterrupted. She had had similar sensations before, but only momentarily. In November the cramps spread to the left side of the nose and the left upper lip. The twitchings came on several times an hour, each time lasting for

some minutes. During the intermediate term, 1883–84, these symptoms decreased, but began again toward the end of the spring term of 1884. The twitchings now spread to other muscles and involved the whole left cheek. During the summer of 1884 considerable improvement was experienced from the use of iron, more nourishing food, and rest, so that the twitchings had ceased at the end of the summer. Towards the close of the fall term, in November, they began once more, and in December became very severe.

She is unable to assign any cause for her ailment, but states that her mother suffers from fainting fits, and a brother from "cramp in the stomach." In the winter of 1882–83 she lived in so cold a room that water sometimes froze there. In reading she often sat with her affected side toward the window of the room. Formerly she suffered from toothache; though at present she has neither unsound teeth nor toothache. She has never had neuralgia, or received a blow or a bruise on the cheek.

When the patient was admitted to the hospital, December 31, various symptoms of chlorosis and anæmia were noted, such as giddiness on standing upright, noises in the ears, palpitations of the heart when walking, also pallor, etc. Examinations of the blood showed 4,300,000 blood corpuscles, and a somewhat diminished hæmoglobin content, 12½–13 p. c. (Malassez). The twitchings in the face were increased by psychical irritation, and became particularly noticeable when the patient undertook to talk. On palpation *the left facial nerve is found to be markedly thicker and more sensitive than the right. It forms a thick, plainly perceptible cord*, which can be plainly palpated even by a tyro. Moreover, the twigs of the trigeminal, on the forehead, show themselves thickened and sore, in comparison with the corresponding twigs on the right side.

Massage, electricity, pyrophosphoric acid, iron water, etc., were prescribed. After a *fortnight's* treatment she was considerably improved. Examination at that time showed that the trunk of the facial was less swollen and sensitive. Prescription: cold douches, liqu. kali arsenicos.

On January 27 it was noted that the patient was free from the twitching, occasionally for days together.

On February 7 the patient had an attack of severe headache. The nerve twigs on the forehead are more swollen than usual. On February 13, the patient was discharged, nearly well. Recently the patient is so much improved that for several days at a time she will not have a single twitch.

Sciatica.—Sciatica is now, in all Germanic countries, for the most part, treated with massage; and a great mass of testimony has been accumulated in favor of this mode of treatment, which has augmented the prospect of cure in such cases.

In reality, it would have been about as well to discuss sciatica in the chapter on muscular affections, as in this place, since that disease, in a very great number of cases, is of myogenic-origin, and is due to myitis in the neighborhood of the nerve trunk, usually to myitis in the glutæus maximus and medius; while anæmia, chlorosis, hysteria, and "nervousness" are of less ætiological importance here than in other neuralgias, especially those which occur in nerves of the head. Of gen-

eral causes, diabetes is, by far, the most common ; and one must not omit to seek for the presence of this disease.*

The principal point when one employs palpation in the examination of a sciatica is to determine how far infiltration has invaded the glutæi muscles. The examination is made in the manner described above (p. 93). Although on anatomical grounds, such infiltrations may readily escape the perception of the masseur, still the rule holds good, at any rate for me, that energetic frictions should be made in this place, even if no pathological changes can be found. Furthermore, one should make vigorous tapotement with the fist, downward along the course of the sciatic nerve, as far as the hollow of the knee ; and effleurage over the whole extent of the leg is to be recommended. (It is self-evident that one must look out for myitis along the whole course of the nerve.)

Finally, nerve-stretching plays an extremely important rôle in the treatment of sciatica ; since the anatomical relations are such here as to admit of its being easily and effectively performed. The easiest and best way to make it is as follows : the patient who, during the sitting, has lain prone on the massage bench, turns himself and lies upon his back ; then the masseur, facing the patient, lays the lower leg of the patient upon his own shoulder and places his hands upon the patient's thigh above the knee so that he can prevent any flexion at the knee, and slowly makes flexion at the hip-joint, as long as the patient is able to endure it.†

Massage treatment of sciatica affords very good prospects of success when the ætiological factors are not of a grave nature. My personal experience includes only some 14 cases. In two of these cases the treatment was totally unsuccessful, one of

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* I have myself never treated but one case of diabetic sciatica by means of massage. On the other hand, in cases of sciatica where the cause was unknown, as well as in those of a myogenic nature, which responded more or less favorably to massage, I have been able to demonstrate small amounts of sugar in the urine daily (most easily about two hours after the principal meal). Such slight glycosuria, however (which by itself considered need not import gravity into the prognosis of a neuralgia), occurs very frequently in cases which present no neuralgic symptoms.

† In order to determine the degree of flexion we must be guided by the amount of pain the patient experiences. I am accustomed to push it to the point when the patient with an expression of anguish on his face calls out that he "cannot stand it" longer. I bet him anything he likes he can stand it ; hold the limb for an instant in the position already reached, then quickly increase the flexion a degree or so, and after that let the limb slowly sink to the resting position.

them being diabetic, and the other was massaged only a few times. In the remaining cases, either obvious improvement or complete restitution ensued. Similar cases are chronicled in the mass of information published on this subject by Berghman, Craith, Douglas Graham, Faye, Gussenbauer, Johnsen, Norström, Winge, Zabludowsky and others. The treatment, however, must be continued for months oftentimes.

Mrs. C. H., from Eastern Sweden, fifty years old, submitted in June, 1886, to a "water-cure," at Carlsbad, on account of some slight internal ailment. The patient had suffered from sciatica in the right side for about seven years, and during the winter had had about ninety massage-sittings with a physician, but without result. (There were pains, too, in the left side, but they were comparatively light.) Examination disclosed considerable infiltration of the glutæus maximus and medius on the right side, and some unevenness from indurations: the lumbar muscles were very tender to the touch but presented no other determinate changes on palpation. There was pain on pressure, also, along the sciatic nerve, especially where it emerged from the pelvis. For the rest, no particularly tender spots and but little atrophy could be made out.

On the left side no plainly palpable changes were found in corresponding situations, but the patient had myites elsewhere, and infiltrations could be felt in the cucullaris muscle, in places, on both sides. The pains were constant; the gait strikingly slow; perceptible limping was exceptional; in going up stairs the patient always put the left foot in advance, and proceeded so, "step for step." Inasmuch as extensive myitis existed, the patient was subjected to full mud-baths (29° R.), but experienced no distinct improvement from them. Massage was begun at once, as the patient could stay in Carlsbad only two weeks longer. One sitting daily was given. Energetic frictions were made upon the affected muscles, and the lumbar muscles as well, and tapotement was made over the sciatic, and the nerve was stretched; the treatment was the same that the patient had had previously; the only difference being, as the patient put it, that the previous treatment was "much more moderate." Meanwhile she began to improve with unusual rapidity, progress being noticeable from day to day. After sixteen sittings, subjective symptoms and functional inability had almost entirely disappeared, the palpable changes being only partially removed.

As I had notes on only a few of my nerve cases (at this writing I have only four cases of sciatica that I can "control," of which Mrs. H.'s is the most presentable, so far as the above account covers it); I yielded to the temptation to adorn this page with the report of a complete cure after sixteen massage-sittings, and wrote to Mrs. H. for further particulars. These came, a reproach to me, but undeniably full of instruction for my readers. Mrs. H. enjoyed her improved condition for some time, but, later, gradually relapsed, and now suffers nearly as much from her sciatica as she did previously, and has "rheumatic" pains in her neck and shoulders besides. She asks me whether she may expect improvement, or possibly complete restoration to health, from a renewal of massage treatment. Basing my reply on the general rules given above and on the special peculiarities of her case; my reply is, yes, to the first part of her question, and a question-mark to the second.

What has been set forth above may serve, for the reader, as an exposition of the massage treatment of neuritis or neuralgia,

which may affect any nerve whatever. These affections, when the nerves are accessible, can and ought to be treated by means of massage. When palpating, except in such peculiar cases as have been noted already, one must be content, usually, if he is able to assure himself that there is a condition of painful tenderness over the nerve.

In cases of traumatic injury to nerves, massage is employed for purposes analogous to those noted already on p. 81, in treating of traumata in general, and here, as there, effleurage should be resorted to to promote healing, oppose inflammation, etc., and frictions to remove the products of inflammation. In contusions, where disturbances of sensibility and motility, under very various relations, as well as others of a trophic nature, not infrequently present themselves, a quick and favorable course of the process is demanded. The same thing is true after bloody traumata or after operations, especially after the modern nerve-suture (Tillman's). One must wait in these cases till the skin is completely or nearly healed before beginning treatment with massage, which must be extended to the corresponding muscles, and must always proceed hand in hand with other appropriate remedial measures, especially the electrical. It is clear that favorable results are to be expected in such cases only where aseptic healing has taken place, which may give hope of a restoration of conductility. On the other hand, in cases in which the central and peripheral nerve-stumps have each healed independently, with the formation of scar-tissue, and a considerable gap, perhaps, exists between the two, all treatment is hopeless before the operation of suturing the nerve has been made.

I append an account of the course of a simple contusion of the radial nerve in one of my first "massage cases." It was during my term of service in the Upsala Hospital, and I made full notes, which I still have, upon it.

John Eriksson, a servant, twenty-seven years old, came to the hospital in Upsala on October 4, 1878. He complained of a sudden impossibility to use the right arm, which was first noticed on September 6, when the patient awoke in the morning. He has never been ill, excepting when he had a furunculosis three years ago. He had, after a hard day's work, slept with unusual soundness through the night, and stated, when questioned about it, that perhaps he had jammed his arm against the edge of the bed while he was asleep. On inspection, when in a position of rest, the right arm presents nothing abnormal excepting a scarcely noticeable discoloration on the outer side of the radius, eight centimeters below the external condyle of the humerus, and a small area of intense painfulness on pressure exactly over the place where the radial nerve, after giving off the ramus superficialis, penetrates the supinator brevis

muscle, and where the two nerves lie close to one another—one on the inside of and the other upon that muscle. The forearm is normal in its movements of extension, flexion, and pronation; active supination was performed with greatly diminished energy. If the forearm be raised, the hand hangs down and the patient is powerless either to extend the hand or to hold it in extension. So, too, he can neither extend the fingers nor abduct the thumb. The remaining active movements can be made. Still, their force is considerably diminished; and while the patient, who is not left-handed, can press the dynamometer to 150 with his left hand, he cannot register more than 30 with his right hand. The hand is thereby strongly and involuntarily flexed against the forearm. The sensibility, determined by an ægesimeter within the area innervated by the superficial ramus of the radial nerve, is clearly below the normal. The galvanic current calls forth weak muscular twitchings within the paralytic area.

The patient received protracted massage, consisting of effleurage over the forearm and a short application of the galvanic current twice daily, the massage treatment being considerably the larger factor. Immediately after the séance, the difference in sensibility is almost completely abolished. Six days after the beginning of the treatment (10th December) the patient can extend his fingers weakly for the first time; on the 21st October he was able to hold his hand in the extended position, though unable to extend it actively; on the 30th October, he was able to execute all movements that were previously impossible, though with diminished energy, and the sensibility is completely restored.

CHAPTER IX.

JOINT DISEASES IN GENERAL.

Massage has become, in our time, one of the most important of all factors in the treatment of most cases of joint-disease. This is true of all Germanic countries, including the Scandinavian, and of France; and it will not be long, probably, before it is true, also, of other parts of the world, where methods are still in vogue that are considered "old-fashioned" among us.*

This form of treatment makes large demands on those who practice it, and is seldom performed with adequate knowledge of the subject by those who are not physicians; therefore it is well, as a rule, not to entrust the massage of diseased joints to persons who are untrained or incompletely trained in medicine.†

Simple traumata of different kinds, such as contusions and sprains, also reduced luxations in some cases, should by preference be subjected to massage treatment immediately after the injury (or the reduction, in case of luxation). After injuries which give rise to wounds, be they penetrating or non-penetrating, after fractures, as well as after operative invasion of a joint, massage *in loco* is not to be employed till the wound has healed.

In cases of purely serous synovitis, both acute ‡ and chronic, massage is employed during the entire course of the process.

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* Even in antiquity, European physicians (*e. g.*, Hippocrates) as well as laymen, made use of frictions to counteract various joint-diseases, a form of treatment which has been and is widely spread as a folk remedy among many civilized and uncivilized races. Bonnet should be named as the man who, about the middle of this century, contributed by the weight of his authority to securing a place for massage in this branch of scientific medicine's service. Mezger has written an article that has attracted much attention entitled "De Behandlung van Distorsio pedis mit Fricties."

† This rule is, however, not without exception. One of Ling's pupils, the veteran De Ron, has recently died in Sweden. He was a man without medical training, in the sense that physicians use that expression, but, all the same, by reason of his wide experience, his admirable technique, and great assiduity, he had such skill in the treatment, by means of gymnastics and massage, of at least certain joint-affections, that few physicians could boast of better or even so good results in similar cases.

‡ Professor M. Schüller, of Berlin, whose admirable work on inflammations of the joints I have followed, for the most part, in this chapter, so far as the exposition of the different forms of articular inflammation is concerned, holds that all massage is con-

The same is true of chronic rheumatic joint-affections, when they come under treatment before true anchylosis has set in.

In the so-called metastatic joint-affections, which appear in the course of certain infective diseases, as well as in other sero-purulent (sero-fibrinous) or purely purulent inflammations of the joints, indications for massage first occur at the termination of the acute phase of the process—if there is then any reason to hope for even a partial restoration of functional power. When, however, true anchylosis has set in, or when the cartilage is destroyed over any considerable area, which may happen without an anchylosis being formed, then the prospect of benefiting the patient by massage amounts to nothing at all. The diseases of the joints, which have been mentioned, together with their after-effects in the joints, are those which set massage its most satisfactory tasks, and in which its usefulness has been most fully demonstrated. It may be employed, however, with some advantage in certain forms, or at certain stages, of some other joint-affections.

Thus it is probable that in the incipient stages of slight cases of arthritis-deformans, massage may be useful in arresting or delaying the process. It would appear, also, that, in some cases, at least, if resorted to as soon as the premonitory symptoms show themselves, it is capable of preventing the complete development of "attacks" of genuine gout; and it is able, even in severe cases, to effect relief and augment the restricted functional power of the joint. In the earliest stages of gout it is probable that massage may serve to counteract or delay the further development of the disease within the joints. The applicability of massage to tubercular joint-affections has not been fully established. Massage, however, is of undeniable value in certain after-effects from these diseases, and can prove beneficial in some cases even during the existence of the tuberculous process.

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traindicated in acute serous synovitis, so long as it is fresh. Despite my high estimation of Professor Schüller's experience and judgment with regard to joint diseases and their treatment in general, it is impossible for me to coincide with his views in this connection, for I have treated absolutely fresh, acute serous synovitis with massage—obtained good results—and therein had just the same experience as many others. Moreover, it would be strange if a mode of treatment whose value in the treatment of recent sprains is acknowledged by Professor Schüller, which affection is accompanied by a serous acute synovitis, should be contraindicated in such a lesion which is not of traumatic origin, *i. e.*, in case other general or local contraindications are lacking. Everything depends upon the way in which the massage is given, *i. e.*, upon the form of manipulation, concerning which more hereafter.

Furthermore, it is not improbable that massage may serve as a suitable accessory in the anti-syphilitic treatment of venereal diseases of the joints.

Massage, so far as I know, has never been employed with any effect in the treatment of neuropathic joint-affections, if we may use such a term. Its place in the treatment of joint-neurosis (Brodie, Berger, Esmarch, Sormeyer, Wernher), I hold, has not been fully determined, if by joint-neurosis we mean the extremely rare conditions which present subjective and never objective symptoms (which conditions really ought not to be classed with joint-diseases at all). Nevertheless, a large proportion of cases which are classified under this head are to be referred to the initial stages or the after-effects of other articular affections (or even to such affections while still in progress, frequently, for instance, to a simple, circumscribed synovitis) whose pathological basis in the affected joint is genuine, but difficult to make out by an examination. The treatment of such cases, whether by massage or other means, falls under the rules which apply to the primary affections.

Treatment has to do, generally, with one of the five great joints, which we name in the order of frequency with which they are invaded by disease, viz., the knee, ankle, wrist, elbow, and shoulder.* The hip-joint, on account of its protected situation, due to its thick coverings, is ill adapted for massage; and for the same reason it is comparatively seldom the seat of such processes as call for massage. The small joints of the hand and foot constitute a tolerably insignificant contingent.

The examination of joint-cases, with a view to massage, demands skill, but most of all a thorough and intimate knowledge of this branch of anatomy; wherefore a review of the same is not out of the way for him who aims to busy himself with joint-massage if, as may sometimes chance to be the case, he finds that the impressions gained in the dissecting-room have lost something of distinctness and accuracy during the lapse of years.

Here, as elsewhere in this work, I take for granted that the

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* If we reckon on the basis of traumatic cases only, the order of frequency is somewhat changed. Of the 145 cases treated by Berghman, in Stockholm, the ankle-joint was concerned in 70 cases; the knee-joint in 41, the wrist in 10, the tarsal-joint in eight, the elbow-joint in five, the humero-scapular-joint in three, and the clavicular-acromial-joint in two. The knee-joint affords the masseur as many cases as all the other joints taken together,—at least that is my experience.

reader is acquainted with the various diseases named, and the abnormal conditions which characterize the general and special changes that result therefrom. Since the diagnosis of joint-diseases in any event is, in many cases, a very difficult matter, one must, in order to attain skill therein, accustom himself to make as accurate and as comprehensive an examination as is possible. A brief reminder of the course to be followed in an examination of this sort may be excused, therefore, by those for whom it is superfluous.

Having heard the patient's account of the disease and his subjective troubles, one proceeds to an inspection of the affected joint, in which one ought to make it a rule never to neglect to compare it with the corresponding healthy articulation. The color of the skin over the joint may afford important information; *e. g.*, in the case of traumata, of acute inflammations, especially when they are purulent, as well as in cases of tumor-albus. The position of the joint may disclose a fracture or luxation, and is characteristic, moreover, for the different joints when in an inflamed condition. Among other phenomena to be carefully noted are the changes of form peculiar to each joint, which are caused by increase in the contents of the joint-cavity; and also those changes which are due to thickening of the articular or peri-articular parts, and assume much complexity of form. We are all familiar with the pronounced changes, which are evident to the most unpracticed eye, that occur in severe sprains, in a joint affected by dropsy (following a sero-fibrinous or purulent inflammation), in tuberculous, deforming, and other affections of the joints, or which result from protracted immobilization. On the other hand, every masseur knows how easily even an experienced physician overlooks the insignificant local swelling, which may signify a circumscribed, simple synovitis, or a so-called "capsulitis," unattended by any augmentation of the contents of the articular cavity. By measuring the circumference with a tape-measure, or the most variable diameters by means of calipers, it is possible to obtain a more accurate idea of the changes in volume. It is of paramount importance to determine how far, and in what way, any limitation of motility in active movements is present. One then passes to palpation, which is the most important part of the examination and should complete and illumine the clinical picture in the highest possible degree.

In order to get a clear idea of the nature of the contents of the joint-cavity, our principal means is found in examining the fluctuation in the way so well known to every medical student that we shall not describe it further. Very accurate knowledge of the changes in the soft parts of the joint, particularly of the capsule, may be obtained by making pressure and slow frictions upon them. (For the latter it is more appropriate that the skin over the joint should be smeared with fat.) When it seems necessary, repeated comparisons should be made between the joints of the two sides, and the amount of tenderness to pressure should be noted. Where the joint-capsule is protected by a covering of thick tissues, the examination is rendered difficult and yields, of necessity, incomplete information only; but where the coverings are thin, and especially where one can press the capsule against a flat surface of bone, *e. g.*, the greater part of the anterior side of the knee-joint, it is possible to recognize very minute changes and thickenings.

While pressing the capsule against the underlying surface of bone with the fingers of one hand and communicating slow passive movements to the joint with the other hand, one is able to tell by the sense of touch, as the synovial membrane slips over its sub-structure, how its own surface has been affected, whether it retains its normal smoothness and evenness, or whether it has acquired hypertrophic "fringes," granulations, etc. By means of the passive movements we also gain information concerning the articular cartilages as they glide over each, whether there be any defects in them resulting from purulent or "deforming" processes, incrustations (arthritis-urica), callous-formations from intra-articular fractures, etc.; gross changes may give evidence of their presence to the sense of hearing as well as to that of touch.

In making passive movements, one of the operator's most important duties is to determine the degree of a possible restriction of mobility, and to note the relation between the amplitude of the passive and active excursions, as well as to observe how far such restriction depends upon changes in the articular or peri-articular parts, or in the muscles. Contractures of the latter may be made out easily by making as wide a passive movement as is possible, and, during the maximum-excursion of the part, palpating the muscles or groups of muscles in question, to feel

how far short they fall of their greatest elasticity. If the movements cause violent pain, one can only attain the purpose of such an examination through the exclusion of the patient's volitional and reflex influence by means of an anæsthetic. The examination must be as rigorous as possible and embrace all accessible parts of the joint. Even when one goes to work in this way he will frequently, during the course of the treatment, make some more or less important addition to his understanding of the case which may prove of practical service.

As was noted above, after the more severe forms of joint disease, it is first of all necessary to decide, through the examination, whether, on the whole, it is worth while to attempt to restore functional power to the joint, *i.e.*, whether one can prevent anchylosis as well as more considerable destruction of cartilage. The least perceptible mobility in a joint settles the first question; and such mobility may be quite evident about *one* axis, while around *another* axis, at least at first sight, all movement may seem abolished. So, also, it is a tolerably sure sign that one has not to do with a true anchylosis, if the patient shows much pain when the operator seeks to execute a passive movement of the joint with a moderate degree of force. In order to gain as much insight as possible as to the condition of the cartilage, it is necessary to take fully into consideration the history of the case; to investigate the position of the bones of the joint with relation to each other, since the bones readily show changes where there has been any considerable destruction of cartilage; and to palpate accurately the boundaries of the cartilage, besides. It is a rare thing for the state of the cartilage to offer any hindrance to the restoration of functional power where the other parts allow it.

If the mobility in a joint be greatly restricted or abolished, but there is still ground for hope that it may be restored to some extent, the question arises spontaneously whether *brisement forcé* should be resorted to or not. The answer to this question is often a "matter of taste;" in other cases there are definite reasons for or against it.*

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* "Brisement," as is well known, is preferably made when the patient is under the influence of chloroform, partly for the sake of excluding the patient's muscular action, partly because the pain due to such an operation is so agonizing that a weak patient may receive a severe general "shock," and a timid one be scared off from any further

One has first and foremost to take into consideration the processes that have transpired within the joint, and the present condition of the articular and peri-articular soft parts. When no extensive changes have taken place in or about the joint, *e.g.*, when it has become "locked fast," chiefly through protracted immobilization, one frequently can by means of a *brisement forcé* (always to be cautiously performed) stretch the capsule and ligaments quicker than by any other means, loosen the tendons, etc., and restore mobility to the joint, and thereby cut short transformation in all the soft parts (and possibly even in the cartilages), which a further continued rest would occasion. In those cases of restricted mobility, on the other hand, in which violent joint inflammations, *e.g.*, of a tuberculous or pyæmic nature, have taken place, and in which well marked hyperplasias and infiltrations exist in the soft parts of the joint and their neighborhood, one cannot expect to bring about any considerable increase of mobility in the joint before the changes in the soft parts have passed their regressive stage, no matter how much he may loosen the adhesions and stretch the shrunken tissues through *brisement forcé.* Moreover, in such cases, it may be a very difficult matter to keep the acute inflammation which will be caused by the *brisement,* within due limits, on account of the changes in the synovial membrane and of the disturbed relation between the processes of circulation and resorption. For these reasons it is better, in general, not to resort to this procedure in the cases under discussion.

In massage of the joints, so far as it concerns the joint itself, and not the groups of muscles pertaining to it, only two different manipulations are usually employed, viz.: effleurage and frictions.* Occasionally it may be advantageous to use tapotement in chronic, torpid processes, *e.g.*, hydrarthron, where one may

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treatment—at least if it involve "brisement." In "brisement" during chloroform narcosis (in which it is often quite easy to communicate extensive movements to joints which showed scarcely a trace of mobility before the narcosis), one has the power to stretch the muscles and to make a trustworthy prognosis. We should never promise the patient wider mobility for the future than we are able to communicate easily to the joints of the anæsthetized patient, after the brisement and the stretching have taken place.

* Some authors talk about the pétrissage of joints. What do they mean by it? Pétrissage, when properly executed, is so made that a portion of tissue is lifted up and pinched between the fingers (of one or both hands). In joint-massage we have a firm substructure very near to the soft parts, and by pressing and rubbing the soft parts against it we attain the end of pétrissage, which then becomes friction.

bring about a "change of tune," produce congestion in the entire joint and an intensification of the process, which thus is brought to an end more speedily. If we wish to bring about a larger degree of motion and augmented power of resorption in a joint, after severe inflammatory processes attended by hyperplastic residues, our best way, perhaps, is to make local use of hot water, sand or mud baths, or of douches, rather than to make tapotement upon the joint, which is likely to be very tender still.

Effleurage and frictions in this manner! It is an easy thing, for any one who comprehends the different effects of these two manipulations, to assign each of them its proper rôle in any given case; so we refer in this connection to rules which are analogous to those which we have set forth elsewhere, possibly with more than sufficient fullness. Effleurage is excellent wherever it is of prime importance to oppose a florid inflammation; and is of great service, therefore, in traumatic joint affections as well as in acute serous synovitis. When these are quite "fresh" and at the height of their florid stage, and all vigorous mechanical excitation must be avoided, effleurage, when executed by light strokings over the veins of the inflamed part, constitutes the *only* rational manipulation, and is as simple as it is effective. We must not forget, in these cases, that it is by reason of the strokings being made *over the vessels on the central side* of the inflamed part, and not upon it, that they are able to hasten the circulation and counteract the stasis and inflammation. In other cases, too, effleurage should constitute a part of joint-massage, always and without exception, in order to influence the circulation and through it the resorption and the whole local nutrition.

So soon as it is desirable to promote the regressive metamorphosis, the destruction, and finally the resorption of pathological tissue-elements, frictions become the manipulation of most consequence. If one has to do with an old exudation or with masses of connective tissue already somewhat organized and with their accompanying newly-formed capillaries, then these manipulations are to be made with a very considerable degree of force, and usually with the thumbs. In these cases, and also where a strong mechanical stimulus is not harmful, we make effleurage, also with some force. It is well to begin and close the séance with effleurage. Divers other general rules hold good as regards

technique, which we briefly notice here, in spite of the directions given in the second chapter.

One always begins the sitting to more purpose by making effleurage strokings along the course of the vessels, beginning just below the joint and stopping a good bit above it. Tapotement should never be used at the beginning of the sitting, except when its use is specially indicated.

Frictions should always be begun on the parts of the altered tissue which lie nearest to the centre of the vascular system; because here one can press the debris more easily, and with less pain to the patient, into the lymph-channels than he can in the middle and peripheral portion of the tissues, where tension and resistance in the small lymphatics is greater.

The passive movements are brought in toward the close of the sitting. They should be followed by effleurage, to take away the irritation and pain occasioned by them, which is moreover, always a proper manipulation with which to close the sitting.

When local hot baths or douches are prescribed for the patient, then the use of massage immediately following those procedures is to be recommended, inasmuch as the tissues are more hyperæmic, the resorption more active, and the tenderness less at that time.

If muscular atrophy or a tendency thereto shows itself, as is always the case if a joint has had its movements much restricted for a long time, one ought never to omit to treat the affected muscles by means of all the massage-manipulations.

Gymnastics constitute an important adjuvant in the treatment of most of the joint-affections which fall to massage, but should not be employed simultaneously with it under all circumstances. I would lay especial emphasis on this fact,* though I know that some other writers teach the contrary. So long as an inflammatory process in a joint is entirely fresh and in its most acute phase, movements are harmful, since they augment the hyperæmia of the joint (*ex analogia* with what always happens when an organ is functionally active), work as an excitant, and hinder the regression of the process. Their power of hastening

* It is true that, in cases of sprain, the inflammation passes away sooner when, simultaneously with the massage, the patient is allowed to use his joint earlier than was customary according to various older methods. But that is no proof that movements act beneficially. Cases get well quicker if the joint is allowed to rest at first and massage is employed.

the circulation is not sufficient to offset the disadvantages I have named; besides, that power may be made good by effleurage. I am firmly convinced that all movements of the joints, whether active or passive, are contraindicated in the conditions existing immediately after contusions and sprains, as well as after the reduction of luxations, and in fresh acute synovitis; effleurage, however, may do good service in these cases. In proportion to the diminution of the intensity of the inflammatory symptoms, that is to say, after the lapse of a few days (and long before the immobility of the joint can cause prejudicial local results), we may begin letting the patient make cautious use of his joint, and then extend it more and more as the inflammation abates.

In the treatment of torpid inflammatory processes, and, above all, after completed processes of this sort, when there is a prospect of restoring mobility to the joint, gymnastics play a very essential rôle through both passive and active movements, and always must be employed simultaneously with massage.

A few words may be devoted here to the relation of massage to those various conditions in joints which we designate by the name of anchylosis, contracture, and loose-joint (*slink-led*).

In a case of true-anchylosis, *i. e.*, when the mobility of the joint is entirely abolished by broad accretions of a fibrous, chondroid, or even osseous nature, massage can do nothing for the anchylosis itself. In false-anchylosis, on the other hand, when motion in the joint has been annulled through adhesions, exudations, infiltrations, and shriveling of the articular and peri-articular soft parts, through the growing together of the tendons and the surrounding parts, etc., if the cartilage and bone have undergone little or no change, then massage may bring about a restitution of elasticity by promoting the resorption of pathological tissue-elements, as well as by restoring the soft parts to their normal or nearly normal state, and it thereby simplifies certain problems of gymnastics and of orthopædics, mentioned in Chapter V, which are here of essential importance (gymnastics always and orthopædics often).

In arthrogenous, just as in myogenous contractures, massage has a wholly similar influence to that exerted by it in *anchylosis spuria, i. e.*, it can remove the changes named above both from the articular parts and the muscles, but it cannot stretch them directly. As regards cicatricial-contractures, we refer to what was

said on p. 87, and on p. 100 concerning Dupuytren's contracture. Neurogenous contractures, when of central origin, are very little affected by massage, though we may not deny it all influence whatever. In the rare cases in which peripheral causes are found for such contractures, the influence of massage depends entirely on the ætiological nature of such causes, and no rules of general validity can be laid down as to the prognosis in these cases.

Finally, so far as loose joints are concerned (which term is usually taken to mean a too mobile pseudo joint resulting, for the most part, from a fibrous union of undue length between the ends of the bones, after a resection) it must be said that massage has no power to exercise a "curative" influence directly upon the same; though it certainly may contribute to a greater firmness of movement through the strengthening of the proper groups of muscles. The principal treatment of loose joints is by means of orthopædic contrivances for restricting the movements.

The therapeutical worth of massage is very limited, likewise, in cases of stretched and slack articular capsules. It may hasten the resorption of a large effusion in a joint and so contribute toward the removal of an ætiological element of that condition, though this is attained more quickly and readily through puncture and washing out; and it may strengthen the oft-times atrophic muscles, and possibly thereby help a little in rendering the capsule tense; that is all it can do.*

In the massage treatment of severe joint affections one must be prepared to work energetically every day, for weeks, perhaps for months, in order to get a step nearer his aim, namely, to give his patient a fairly useful joint; and the masseur must not let

* Messieurs the masseurs by profession frequently declare, without showing any further reason for the statement, that massage is an excellent remedy for loose joints and relaxed capsules. This is probably due to the incitement of Hippocrates, who once, in an unguarded moment, gave utterance to the saying that massage which could loosen a firm joint also had power to bind a loose one. There are many people who measure the weight of authority by its length of days, and will, therefore, agree to nearly anything, if Hippocrates has said it. As for me, in such cases as these, Dr. Evald Johnsen, who reports that he has obtained good results with massage in cases of relaxed capsule in Copenhagen, counts for more than Hippocrates. When this was ready for the press, I wrote to him asking for further explanation. His answer discloses what I might have anticipated with tolerable certainty, *à priori*, that muscle-massage was his main stay in such cases. Since I cannot fully share his views regarding these cases (views, moreover, that he advances with great reserve, and have only theoretical interest), what is said above should stand unchanged; and I hope that in the main it will meet with the approval of the eminent Danish masseur, who is free from all "massage-fantasy."

his courage sink if it seems at the outset difficult, nay impossible, to attain that end. It is possible to find, in such cases, that the mobility in the joint is scarcely perceptible; its outer form wholly effaced by masses of new connective tissue or by a hard œdema, rich in cell elements, with a pronounced plastic tendency; the capsule, so far as it can be palpated, utterly infiltrated, and much thickened; the muscles atrophic and, worst of all, more or less shortened, perhaps; and a large part of the limb colder than normal by reason of its impaired circulation. Then we aim to remove the inflammatory products from all the tissues (especially from the joint-capsule and its adnexa) and to effect a quicker circulation by means of forceful frictions and strenuous effleurage; to counteract the atrophy of the muscles by using all the massage-manipulations, and simultaneously to employ orthopædic measures, which are more capable than any other means of stretching these as well as the other shrunken soft parts; to employ the passive movements with moderation (*i. e.*, in so far as may be without reducing the patient through excessive pains and without lighting up a new inflammation, and only to that degree in which massage is able to bring the tissues back to a normal condition), in order gradually to augment the mobility of the joint, to stretch or tear asunder the adhesions, and free the tendons which have grown fast to their sheaths; to avail oneself of the aid of systematic active movements when a sufficient amount of mobility has been gained; to employ mud-baths, douches, and other local measures; and, finally, not to neglect the general treatment of the patient when that is needed. All these elements make up the most beautiful and interesting of the problems of the medical masseur, whose successful solution demands no small stock of knowledge and experience, and still more of tact, energy, and persistence, but which also gives results that far transcend the hopes of those who have not learned by experience what can be achieved by carrying out a rational course of mechano-therapy.

I append the following "miscellaneous" but condensed practical hints on the five principal "massage-joints:"—

When massaging the *shoulder-joint*, it is best that the patient should take the reclining position upon a massage-bench. Frictions constitute the principal procedure here, in so far as we confine our attention to the joint as such; effleurage being, on account of its anatomical relations, of but little use. The capsule is best gotten at in the axilla, when the patient holds his arm outstretched in the direction of the neck

and head. If the patient cannot put his arm in this position at the beginning of the massage-treatment of the false anchyloses which are so common after the reduction and treatment of luxations, the arm is to be abducted slightly sideward, and the masseur makes frictions, as well as he may, in the upper part of the axilla, upon the oft-times greatly thickened capsule, with his middle three fingers. One should not omit to act on the capsule, by means of frictions, along the lower edge of the acromion, through the deltoid, and from behind through the tendons of the scapular muscles. During the treatment we should keep in mind the atrophy of the deltoid, which is a common result from immobilization, and likewise the contracture of the teres major due to the same cause (which frequently constitute a serious hindrance to a full lifting of the arm), and endeavor to counteract them by gymnastics, so soon as possible.

We call special attention to the need of making search from behind, in the examination of the joint, for the fixation due to the inflammatory process within it. In doing this one should palpate over the scapula with one hand while imparting passive movement to the joint with the other. Nor should we forget the movements of the arm, in which the scapula normally participates, or that extra-capsular inflammations also result in a similar participation by the scapula when the arm is moved in a direction opposite to the focus of inflammation. We should, further, be mindful of the fact that an exudation within the joint, unless it be excessive, causes a bulging of the hinder part only of the capsule, whereas a bulging in the axilla is caused, usually, by an effusion within the subscapular bursa. One should not allow himself to be deceived by possible bursitis in the subdeltoid bursa, which may cause the deltoid muscle to bulge outward and make the case seem graver than it really is; or in the subacromial bursa, which is more faintly indicated through the deltoid at a point further forward than in the last case; or in the small "Gruber's bursa," lying over the coracoid process. Above all, we must not mistake abscesses in the subcutaneous or the deep connective tissue, or in the lymph glands, for processes within the joint, and apply massage to them!

In massage of the *elbow-joint*, it is an advantage to the masseur to have the patient face him while sitting on the other side of the massage-bench, and to have him place his arm on the bench for support. The capsule is most readily accessible from behind, partly when the arm is flexed, directly over the olecranon, through the tendon of the triceps, which must be admitted to be rather thick; partly and better, through the thinner coverings on both sides of the process, where, on the inner side, we have the ulnar nerve free from muscular covering for a short space. One massages the joint on the outer side through the anconæus quartus muscle. Anteriorly frictions are of little avail, because of the thick tendinous and muscular covering of the joint; effleurage, on the contrary, when made over the fully extended arm, is the more efficacious. In cases of contracture of this joint, if we seek to stretch the shortened flexors of the arm, by applying a light plaster-bandage to the greater part of the arm (but leaving the hand free of it), while in the position of maximal extension, we must not let the bandage remain longer than a week at a time, in order that we may surely avoid ischæmic shortening of the muscles, which is very easily called forth, especially in the flexors of the fingers. Exudations within the joint cause the anterior wall of the capsule to bulge forward, thereby altering the antero-posterior diameter of the joint; similarly the wall of the capsule bulges backward on both sides of the olecranon. In the examination one must take especial care to exclude with certainty all fractures which *may be very difficult to recognize*, when they concern the lower part of the humerus, the neck of the radius, the olecranon, or the coronoid process.

Not much need be said concerning the massage of the *radio-carpal* joint. Here too masseur and patient sit opposite each other, with the massage-bench between them, and the patient lays his hand upon the bench. In cases of sprain or other inflammatory processes in the joint, the most conspicuous changes in the capsule are situated on its dorsal side and chiefly just inside of the styloid process of the radius. We apply frictions on either side, but with best results on the dorsal side. Effleurage made over the wrist and greater part of the forearm, by means of the thumb and forefinger, is of very great service. Exudations within the joint are difficult of direct detection, since they are very rarely large enough to cause bulging of the capsule on the dorsal side. Radial fractures are recognizable usually by the least experienced eye, from the projection on the volar side, and the corresponding depression on the dorsal side of the wrist.

The *knee-joint*, which gives the masseur more to do than any other joint, is best massaged when the patient lies on his back upon the massage-bench. Frictions are made exclusively upon the anterior wall of the capsule, from which changes in the joint often proceed. This is especially the case in the extremely common affection termed "circumscribed capsulitis," in which one finds an infiltration in the wall of the capsule (there being no perceptible exudation within the joint), on one or both sides of the patellar ligament, and usually in front of the alar ligaments. This infiltration, of whose presence the patient is fully conscious, often is scarcely perceptible through palpation. For effleurage to influence the circulation of the joint at all strongly, it must be made over the hollow of the knee, when the leg is in full extension, for it is at this point that the five-parted arterial blood-stream enters the joint and the corresponding veins leave it. Little need be said concerning the examination, as the least experienced medical student knows how one examines this joint for an exudation. In contractures of this joint, and after every severe lesion affecting it, proper attention must be devoted to all parts of the quadriceps femoris muscle, and any atrophy in them should be counteracted.

In massage of the *ankle*, it is best, too, that the patient should recline on the massage-bench. Frictions are to be performed over most of the joint—partly on the anterior wall through the extensor tendons and at their sides, just at the inner side of the malleolus externus (near to the tarsal sinus lies a favorite seat of infiltration), and partly on the hinder wall on both sides of the tendo-Achillis. Very often it is necessary to expend much labor on the inner side, where the broader part of the capsule is accessible through very thick coverings, principally made up of the flexor tendons, in order to remove the hard, œdematous, "plastic" alterations which often arise here after severe disease of the joint. The same statement holds for the region behind the malleolus externus, where only a small part of the capsule can be reached through the peroneal tendons. Effleurage is made anteriorly over the back of the foot and over the joint, partly behind, and with vigor from the tendo-Achillis upward over the calf of the leg. Any considerable exudation within the joint, as is well known, will cause the capsule to bulge out anteriorly on both sides of the extensor tendons, and, posteriorly, on both sides of the tendo-Achillis; and increases the distance between the malleoli. After a sprain one should be mindful of the fact that a fracture of the fibula may exist in such a case, even when the position of the foot is normal.

When employing joint-massage we ought not to reject other procedures which we have at command—a fault of which narrow-minded mechano-therapeutists are often guilty. It is out of the question to consider, or even to name, all the different

elements of the therapeutics of joint diseases; at the same time it may not be inopportune to call to mind the most essential* of those procedures which, with the exception of gymnastics already named, are most frequently used in combination with massage, or are introductory to it, and to consider their relations to massage.

We have to take into consideration in this connection the following: the ice-bladder; the compressive bandage; the warm compress; the local bath of mud, sand, or water; the douche; orthopædic bandages and appliances; intra-articular and parenchymatous injections; puncture with (never without) washing out.

The *ice-bladder* is used exclusively in acute inflammatory processes, in cases of different kinds of traumatic injury, in acute serous or sero-purulent or incipient purulent synovitis. It acts antiphlogistically and ameliorates pain. It never does any harm, and often, in cases where little else besides rest and the raised position can be prescribed, it serves the laudable purpose of a placebo for the patient.

The *tight-bandage* of flannel, linen, gauze, rubber, or adhesive plaster, on the other hand, is employed in the treatment of chronic processes, or at least not till the acute process has passed into the sub-acute stage. In chronic rheumatic joint-affections, in hyperplasiæ remaining after completed inflammations, oftenest of all, however, in simple synovitis, especially in hydrarthron, we may let the patient have a bandage that will be of good service, if it is well laid on with even tension and moderate tightness. But if it be too tight or is uneven, it does more harm than good; and when one must entrust its application to inexperienced or clumsy hands, little, if anything, would be lost by omitting it altogether. Some physicians who allow their patients to use their ankle-joints very soon after the injury in light cases of fracture of the fibula near the foot, make use of a tolerably tight flannel-bandage, laid on over the foot and lower part of the leg. In hydrarthron one may make use of *forcible compression*, with or without tapping, of course while the patient is in bed, by means of a tight bandage, best if elastic; but the blood-vessels must always and without exception be protected by a padded concave splint. In spite of this precaution, swelling and pain easily arise, and therefore the whole procedure, in which the sponge à la Heine should be used, is better adapted for the treatment of hygroma than for genuine joint diseases.

Warm compresses, local baths of hot water, sand, or mud, and douches are excellent for promoting resorption. In many cases they may or must be employed simultaneously with massage in the treatment of diseased joints. They are in order in cases of chronic inflammation or after processes that have come to an end. Wet warm, or "Priessnitz poultices," consisting of wet compresses and a water-proof cover,

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* I exclude from consideration certain procedures of subordinate importance—first of all bleeding, which has almost universally been given up, and cautery, vesication, plasters and salves of every kind (I even pass over gray-salve here, which in other connections has done such yeoman-service for mankind, as it has pretty nearly everywhere gone out of use in the treatment of non-syphilitic joint affections). Cataplasms, which are inconvenient and unpractical, are superseded by moist, warm compresses or local baths of hot water, sand, or mud, which are better in every way. The everlasting tincture of iodine, which enjoys a high reputation with many, may not be employed simultaneously with massage, since it makes the skin unserviceable for that surely more powerful remedy. Some authors extol the direct application of electricity to the joint, which makes my otherwise reluctant confession the easier, that I too have experimented in this field, where, according to my observation, the constant as well as the faradic current is a mere plaything. Its value in the treatment of muscular pareses, which coexist so often with joint troubles, is undeniable; still, mechano-therapy's results are so strikingly better even here, that one who understands it is readily tempted to avoid the use of electricity altogether.

of oil-cloth or of rubber cloth, may be of service in acute, but not in purulent cases, and have a mitigating influence upon pain in such cases. For chronic cases it is advantageous to use as hot water as the patient can bear for the wet compress. By this means we gain a marked hyperæmia, which continues after the temperature has fallen and vigorously furthers resorption. It is better to let these compresses stay on during the night, when they do not burden the patient, and to substitute a woollen bandage for them during the day. I have never used anything but ordinary water in these compresses, and find it difficult to believe in the utility of the more or less troublesome additions that others make use of.

Local hot baths are employed exclusively for promoting resorption after termination, or even during the course, of torpid chronic processes. They constitute an admirable remedial measure, and deserve to be much oftener used than they have been hitherto. Water-baths may be easily arranged for in every home, as may also the nowadays less useful sand-baths. Mud-baths, doubtless the best of all, are seldom to be had outside of the watering places. These baths act through their thermal qualities, and their usefulness depends almost entirely on the way in which they are given. I usually recommend my patients to have the bath as hot as they can bear conveniently (at least as high as 40° C.), to immerse not only the affected joint, but also a great part of the limb above it, and to use so much of the medium, be it water, sand, or mud, that its temperature shall not sink perceptibly during the bath, which should last from thirty to sixty minutes. I never advise that any additional ingredient be given in the mud-bath; should the like be added to a water-bath, ordinary sea or cooking salt will prove fully as useful as the usually quite expensive alkaline salts, "extracts," or "spring-salts," which are chiefly profitable to those who manufacture them. After the bath, which should be taken once a day, the most appropriate course for the patient is to go directly for his massage treatment.

Douches, especially the so-called Scottish douche, consisting of alternately hot and cold streams of water, have both thermal and mechanical effects, in the latter case very much the same as massage, and are a very vigorous remedy. One should let them play directly upon the joint, as well as over the muscles belonging to it. I am accustomed to begin with a five-minutes' session, and gradually increase it to fifteen minutes; but vigorous patients ought to be able to extend the time under the douche to half an hour.

Bandages, Ligatures, "Capsules," and Orthopædic Appliances of different sorts often work in harmony with massage, and commonly, in that case, with gymnastics too. One must take into consideration, at this point, the extremely important fact (which, therefore, is repeatedly emphasized in this work) that massage has power to counteract the mischievous effects which necessarily follow every kind of bandaging treatment by reason of the pressure and even the immobilization which is excited; which prejudicial effects are manifest in the disturbed circulation, shriveling, muscular atrophy, and passive inflammation. Nowadays, since the merits of massage in these and other cases have become more generally recognized, there are those who, in their enthusiasm over its triumphs, go so far as to estimate massage in a very one-sided way, so it seems to me, and show a tendency at the same time to overestimate the disadvantages and underestimate the advantages of immovable bandages, which surely have been allowed to remain too long in place, or been otherwise injudiciously employed by some. The definitive assignment of its proper rôle to each of the different branches of mechano-therapy, all of which, naturally, have their special disadvantages and advantages, must still be left, in many cases, to the surgical specialist, who, beyond question, should be allowed the last word in such cases.

Meanwhile, we are right in seeking for lighter forms of bandages which may be put off and on readily; in striving to limit the period of their use, and in employing compensatory massage and gymnastics, when it is possible to do so, during the intervals of the treatment with bandages or after it is finished.

In simple contusions and sprains all bandages during the time of massage are superfluous, and in Sweden have passed out of use entirely. We omit any consideration of such bandages as may be necessary when complications occur, since the first indications for massage do not arise before the bandages have become superfluous and healing has begun.

In certain kinds of fracture it is frequently appropriate (see below) to give effleurage when the bandage is applied. The latter may be a light one; for instance, in fracture of the fibula or radius. After freshly reduced luxations, as we shall soon have occasion to set forth more fully, a simultaneous use of massage and bandaging is in order, sometimes.

We have already mentioned the slight and chiefly muscle-strengthening part which massage plays in cases of loose joint, which is treated by means of portable orthopædic appliances. These provide firmness, limit the movements, or at times completely prevent them, and render a retraction of the soft parts possible.

After severe joint-diseases, such as penetrating traumata, purulent, tuberculous, or similar processes, massage, in conjunction with orthopædic braces and appliances of various kinds, is able to remove the pathological after-results and to restore the more or less abolished functional power. I have already emphasized with sufficient fullness what can and what cannot be attained by massage, and every one may readily judge for himself what importance should be assigned to one or another form of treatment in particular cases. It is not within the scope of this work to set forth the different adjuvant procedures belonging to orthopædics; my purpose being merely to mention the most important of those which frequently fulfil as necessary a therapeutical service, to say the least, as massage.

From the well-filled armamentarium that belongs to the orthopædist we shall select only those that, above all others, are essential, and will begin with the simple, cheap, and because of its even pressure, unequaled plaster-bandage, which is of very great assistance to us. It is used with very great advantage for the stretching of contracted muscles (flexors) and other shrunken soft parts in the contractures which commonly persist after severe joint-inflammations. The course of procedure is known to most of my readers: we extend the limb without employing an anæsthetic when it can be dispensed with, reaching the maximum of extension at once or by degrees, as the case may determine; then we apply a slightly padded, tolerably firm, but very light bandage, containing as little gypsum as possible, and let the patient wear it for a time—which I at least would not protract beyond a fortnight. It is then removed, when we are able frequently to determine that a considerable lengthening of the contracted muscles has taken place—and the patient then is treated daily, by means of massage and gymnastics, for an equal period, at the end of which another plaster-bandage is laid on, if necessary, and the same course is followed as before until our aim is reached. Mezger and his pupils have a peculiar way of applying the orthopædic plaster-bandage in cases of deformity and shortened muscles which concern the foot. It has this advantage, that the foot is kept in the redressed position without any difficulty while the bandage is put on, and that a sole is formed under the foot at the lower part of the bandage, so that the patient can move about freely. Special forms of apparatus are needed to attain this end. The most practical of them that I have seen—better than any I have ever employed myself—belonged to our distinguished

masseur, Dr. Helleday, of Gothenburg. It consisted of a rectangular frame of iron, in whose upper and shorter portion was a screw connected with a pad, while a sole for the foot was placed in the corresponding lower part of the frame; the sole could be fixed in one position or another by means of screws, and the arch of the foot left bare. If a bandage is to be applied, for instance, in a case of *pes varo-equinus*, the leg is placed in the frame so that the whole metatarsus, by slowly and gradually screwing down the pad which rests on the limb just above the knee, can be brought into accurate contact with the foot-rest, or sole, which has been placed in the desired "corrective" position. Thereupon the bandage is laid on as completely as possible and is allowed to harden, while the leg remains fixed in the apparatus. We must remember that the foot-rest left the arch of the foot free. At last the apparatus is removed; the plaster-bandage receives some finishing touches over its lower portion; the apparatus is once more applied, and the foot pressed down upon a piece of board laid between the foot and the foot-rest, so that a sole to the bandage is formed. Severe pains frequently occur at first, after the making of the bandage, especially at night, which may be so severe as to necessitate injections of morphine.

The method is an excellent one and gives as good results as any other, to say the least.

I would mention next the ordinary portable appliances, used for both the upper and lower extremities, which have this peculiarity in common, that they consist of two metal splints, adjustable to the length of the extremity, which are held in place by leathern straps and are provided at appropriate places with hinge joints. These appliances, which differ in many of their structural features, serve a variety of purposes; thus, they may be used to relieve the joints of the lower extremities from bearing the weight of the body (for which they are usually used after tuberculous joint-affections among children); when they must obviously extend from a point below the foot to the pelvis, to which they afford support, by means of various devices. At the lower end they are provided with a laced-boot for the foot. In other cases these appliances, which are then provided with simple mechanical devices adapted to their purpose, are employed for the sake of limiting the movements of the limb; for instance, in cases of loose joint, as well as after inflammations and after certain fractures (see patellar-fracture). Furthermore, by means of apparatus of this kind one can stretch shortened muscles and other soft parts, either by using screws or the force of elasticity. In availing oneself of the latter force, it is best to use strong rubber tubes, several turns of which are made, being more or less tightly drawn about hooks that are fastened at proper points of the apparatus. (Such a rubber tube, that has done good service and happens to lie before me at the moment, has a diameter of six millimeters.) The same "many-sided appliances serve, when applied to the lower extremities, being provided with the needful levers, to enable the patient, by means of a few strings, to give himself passive movements of the ankle or knee joints. Finally, these contrivances are employed when one wishes to compensate paralytic muscles or groups of muscles, and so improve mobility by means of so-called artificial muscles, *i. e.*, by means of the above-mentioned elastic tubes. For instance, when a group of extensors is paralyzed it is replaced, in so far as possible, by such a continuously acting artificial muscle, which extends the joint, provided the antagonistic flexors are not in action, and which secures the necessary statical conditions for its mechanical working. The physician has to make sure that the apparatus fits the patient well; that it does not act in the slightest degree as a hindrance to the circulation or press hard upon the muscles; and that the force of the elastic bands, when they are used, is sufficiently great. Even expert instrument-makers, for easily un-

derstood reasons, make grievous blunders on this last point, usually by making the elastic force far too weak.

Intra-articular injections, now somewhat antiquated, are employed in obstinate cases of hydrarthron, usually with tincture of iodine, diluted with an equal or double portion of distilled water, for the sake of starting a "change of tune" in the serous membrane. By means of a fine canula, the joint is injected till it is full of the fluid; after a few minutes the superfluous fluid is allowed to drain away, a bit of adhesive plaster is applied to the wound, and the patient is kept quiet in bed till the acute stage of the synovitis is past. Resorption then takes place without the aid of massage, though it is likely that massage would promote it materially.

The more rarely used *parenchymatous injection* is thus performed: the contents of a Pravaz-syringe filled with a 2 per cent. solution of carbolic acid is injected into the capsule, or its immediate neighborhood, twice or three times a day, in order to promote resorption during chronic inflammatory processes, or after such processes have come to an end. Schüller has observed good results from such injections, especially in shrunken capsules and contractures after simple inflammation of the joints. If one should employ this method during a massage-treatment, which has never been done so far as I know, the injection should be made for a few days in succession, and massage given for a like period immediately after the injections, due regard being paid to the injection-wounds; and the injections and massage then repeated as often as is necessary.

Puncture, which should be *always* followed by a washing-out of the part punctured, differs principally from injection in that its purpose is to remove the mixture of joint fluid and pathological elements from the articulation. It is a procedure which is frequently resorted to for exuberant serous, bloody, or sero-purulent effusions within joints, which threaten excessive stretching of the capsule and liagments.

In the so-called metastatic joint-affections, in which exudations within the joint are frequently of a sero-purulent nature, we may employ puncture and washing-out to advantage (in "purely purulent" cases, it is better to open the joint by an incision and then drain it). Puncture is made with a fine or middle-sized trocar, and the rinsing out with a good-sized syringe or aspirator, the fluid used being either a solution (1 : 100) of Boracic-acid, Salicyl or Thymol, carbolic acid solution (2 : 100), or a solution of Corrosive Sublimate (1 : 5000), after which a fairly tight antiseptic bandage is applied. The massage treatment may be begun as soon as the wound from the puncture is healed, even though the joint should contain some exudation, provided it is not purulent.

Through the employment of this method, one frequently may forestall the results of a too protracted distention of the joint, prevent over-stretching of the same, "change the tune" in the serous membrane, and promote power of resorption. In certain cases, the healing of intra-articular fractures is encouraged by this procedure (see Patellar Fractures). It is self-evident that puncture, like every other operative invasion of a joint, should be accompanied by the most vigorous antiseptic measures.

CHAPTER X.

TRAUMATIC DISEASES OF THE JOINTS.

Contusions and Sprains.—Massage has wrought a complete revolution in the treatment of these conditions. It began as early as the fifties, and now is nearly consummated in those parts of Europe which "set the tone." By reason of it the permanent bandage, which formerly constituted the main factor of treatment, has almost disappeared, and massage has taken its place.

We have complete evidence of the superiority of the new treatment over the old, and may safely claim that it has reduced the average time of treatment to about *one-third* of that which obtained under the old régimé, and has, at the same time, greatly diminished the transition, formerly not infrequent, of simple inflammations due to traumatism to more serious forms of disease.*

Effleurage answers excellently well as an antiphlogistic for counteracting florid inflammation, hastening resorption, and thereby preventing the organization of the products of inflam-

* The average time of treatment under the older methods of various kinds was about four weeks. Bauden, who used cold water baths, had an average of 28½ days; Gassner, who first made use of the ordinary method noted above, had an average of 28 days, on employing massage attained an average of 8.3 days; through a similar fortunate change of systems Mullier brought his average time of treatment from 25 days down to 9 days. Fontaine and Gerst, who followed the new system, reached the favorable result of 4 to 9 and 7.6 days' mean length of treatment respectively. Körner, Podrazki, Von Mosetig-Moorhof, and others, have had similar experience. Berghman's statistics are the most interesting. He treated at Stockholm 145 cases of acute traumatic joint-affections (sprains, synovitis, with and without intra-capsular hæmorrhage) with massage. In 104 of these cases, in which treatment began within four days after the injury, he gave 12.44 sittings on the average; while in 41 cases that were not treated with massage till five to eight days after the injury, he gave 17.60 sittings; in 38 other cases, that did not come under treatment till from nine days to three months from the occurrence of the trauma, the average number of massage-sittings rose to 44.68. All of Berghman's cases were treated twice daily, and his first 145 cases until they were fully restored to health; of the 38 older cases, 35 were healed, 3 were only improved. Of the 104 fresh cases, those affecting the humero-scapular joint, of which there were three only, called for the longest treatment. The following list of joints is arranged in order of the time of treatment, those receiving least being placed last: wrist, elbow, ankle, knee, tarsal joint, and, finally, finger- and toe-joints. The numerous French, English, American, German, Dutch, and Scandinavian physicians who have contributed, by reports of cases, to our knowledge of the massage-treatment of these affections, give similar reports, which serve to put its excellence beyond doubt.

mation. In entirely fresh cases it is the only rational manipulation to make, and should be performed, especially at the beginning of the sitting, with quite gentle strokes, in order to occasion the least possible irritation and not too much pain. If after a few minutes of treatment the tension in the tissues is measurably diminished, then we may use greater force. Not until the case is further advanced and the inflammation less intense, especially if the resorption seems incomplete, is it advisable to introduce frictions into the treatment. This should be done gradually, by means of manipulations that are intermediate between effleurage and frictions.

The sittings ought to be protracted, *i. e.*, for about thirty minutes, and should take place several times daily, when it is possible.

In many cases, particularly in those which are taken in hand immediately after the injury, the incidental effects are very astonishing to inexperienced persons, and most of all the patient, even at the close of the first sitting. Every one who has had a tolerably severe sprain at the ankle, knows what excruiating pains accompany every attempt to use the foot soon after the sprain occurs. It frequently happens that these pains are so diminished at the end of the first sitting, which has reduced the swelling very noticeably also, that the patient experiences scarcely any inconvenience in using his foot, and perhaps may betake himself gladly to a promenade immediately thereafter. Should this be permitted or not? That is a question which I answer with a No, in accordance with what I said, in the general part of Chapter IX, concerning the movement of joints in which an inflammation is still in its most acute stage. The greater the injury, the longer must we let the joint remain at rest; in sprains with rupture of the ligaments, until we may look upon the first act of the healing process as finished. Still it must be admitted that a moderate use of the joint, even during the period which should be devoted to resting it, does not involve, under massage, the same danger of prolonging the inflammation as was the case under the old form of treatment. In slight cases, therefore, we run but little risk if we allow the patient to use his foot very moderately, when, for one reason or another, he very much desires to do so. It is best in that case to make light compression by a carefully applied woollen-bandage, or better by a Martin's rubber-bandage; the only

result of this concession being that the course of the inflammation may be somewhat longer.

The treatment of contusions and distortions of the joints is conducted thus: effleurage (particularly at the beginning, several times daily); raised position; rest until the acute stage of the process is past, or until the healing of the ruptured soft-parts has at least begun to take place; later gymnastics. Accessory measures, all of tolerably little consequence, are: an ice-bladder during the most acute stage; warm wet compresses later; woollen bandages, only if the patient has to move about; and besides these a *mitella* on the forearm for the wrist and elbow joints.

Effleurage should be begun, as has been said already, as soon as possible after the injury, because the sooner it begins the sooner, *ceteris paribus*, will the process be terminated. Treatment ought to be kept up till complete restitution takes place, otherwise there is danger that a chronic inflammation will result (see Case 2, below).

When rupture of the ligaments, without external wound, takes place in sprains, no modification in the treatment is called for, except that the gymnastic part of it be postponed somewhat. I am not able to agree to the statement that such a rupture amounts to a contra-indication of massage, as such ruptures are generally of extremely little consequence when they occur, which is principally the case in simple contusions. Effleurage has only a favorable influence upon the healing, in that it hastens it and restrains the accompanying inflammation within due limits. At least I have always found it so; and I believe I should find unreserved support for my view from the majority of those who have occupied themselves with joint-massage.

1. The patient, an official, 40 years old, sprained his left ankle, 31, VIII, 1873. Pain is violent; and it is impossible to bear his weight upon the foot. The day after the injury, he repaired to Dr. G. Berghman, being carried by two men up stairs. There was enormous swelling around the ankle-joint; effusion within the same, intense tenderness to pressure. After the first sitting, the patient walked by himself down stairs to his carriage; and the next day he went on foot to Berghman's, a twenty minutes' walk. After thirty-six sittings (18 days) restitution was complete. (Berghman, Nord. Med. Ark., 1875.)

2. Baron O. L., 20 years old, fell, November 11, 1887, while dancing, twisting his right leg under him; felt a violent pain in his knee-joint, and was "almost ready to faint"; heard nevertheless, on being helped up, a sharp, snapping sound in the joint. The joint was treated by a "sjuk-gymnast" twice a day for a few weeks. As the patient saw no improvement he called on me November 29. There was a perfectly perceptible effusion within the joint; on the inner side, over the internal accessory

ligament, strongly marked infiltration, and considerable pain on pressure; flexion and extension somewhat limited. The joint was treated with strenuous effleurage over this place, and also the bend of the knee, with frictions over the anterior part of the capsule, and passive movements at the same time. After 17 sittings, given with some intermission, all symptoms, excepting a moderate-sized infiltrate and soreness on pressure on the inner side, had disappeared, and the patient, who desired to celebrate Christmas in the country, broke off the treatment on December 20. On January 21, 1888, he came to me again because he began to feel subjective trouble in the joint; and on examination the same was found considerably distended by a *hydrops articuli*. The patient had thirteen more sittings, on as many days, with effleurage, frictions, tapotement with the flat of the hand, warm-wet compresses at night, and a woollen-bandage by day; under which treatment the joint improved rapidly till it was completely restored. Since then the patient has felt no return of his joint-trouble.

3. V. B., teacher, 38 years old, consulted me on February 13, 1887. Two days before the patient had fallen while skating, and struck his left elbow a very severe blow. The elbow showed tolerably extensive suggillations on its inner side; the joint is much distended by an (mostly bloody?) effusion; on the internal epicondyle, before and behind, there is a linear, very sore ridge; this clearly marked area, however, is firmly united with the humerus—it is probably an infraction. The patient received effleurage, chiefly, for the first few days; some light frictions and a mitella were applied; moreover, the capsule was vigorously manipulated with frictions and the joint gymnasticized. Complete restitution was effected by thirty sittings, on as many days, since which time the patient has had no further reminders of his injury.

Luxations, of which we shall consider here none but the simple traumatic kind, give occasion for massage: sometimes, indeed in most cases, immediately or some time after the reduction has been made; sometimes, though more rarely, under certain circumstances when a reduction has not been made and a new false joint has been formed. Luxations, complicated by lesions of vessels or the skin, or by fractures,* should not be treated with massage, for very evident reasons, before complete healing has taken place. This treatment must be employed, then, in combination with gymnastics, according to the general rules set forth previously for joint-massage, if there be any hopeful prospect of restoring the mobility of the joint. Spon-

* Some authors lay stress upon the valuable quality which massage has of rendering it easier to diagnose luxations and to discover obscure fractures. It is difficult to gainsay this claim, which, if admitted does not settle the question of the propriety of using massage in such cases. We might say, with equal justice, that the simplest way of determining whether we have to do with an abscess or an aneurism, in a doubtful case, is to make an incision. But if the incision were made without more ado, and the case turned out an aneurism, we should have a woful result. Under certain circumstances we can achieve a similar result if we massage, with never so little force, a luxation complicated by a fracture; and I am of the opinion that it is wiser, in all such cases, to conduct the examination in the usual way, in order to exclude fracture, before employing massage, than to make use of massage for the sake of thereby more easily making a diagnosis.

taneous, so-called pathological luxations, due to extensive destructive processes within the joints, offer no field for massage. The same holds good with regard to habitual continually relapsing luxations.

Joint-massage after simple traumatic newly-reduced luxations, aims at preventing inflammatory alterations in and about the joint-capsule, and closely resembles, in many respects, the massage we have just described as appropriate for fresh contusions and sprains. In these cases, too, effleurage is the only manipulation to be used at first, and here it has a marked influence also, if the luxation has taken place in a joint whose anatomical relations are favorable for such effects. However, luxations in such joints are rare, for which reason massage has not the same extended application and practical importance in the treatment of recently reduced luxations as in the therapy of slighter traumatic joint disorders; of which fact a mere glance at the relations in question will suffice to convince us.

Luxations of the ankle- and wrist-joints, unattended by fracture, belong to the class of rare exceptions, as we know, and may be passed over here, since the massage in such cases is also extremely simple. There is very little to be said, too, concerning luxations of the bones of the leg, except that they are accompanied by considerable ruptures of the complicated ligamental structure of the knee-joint, and often by other severe complications which necessitate complete immobilization and contraindicate all massage of the joint. Among luxations at the elbow, that of both ulna and radius forward is combined with fracture of the olecranon almost always; that of the radius alone, as in other rare luxations in which both bones are not dislocated simultaneously, is combined with rupture of the ligaments; in all these cases massage surely ought not to be thought of till after full restitution. In cases of dislocations at the hip-joint, massage can be employed with advantage only for the injured glutæi, gemelli, and pyriformis muscles (which are often much infiltrated), when the head of the femur has passed into the sciatic notch or slipped over to the dorsum ilii. Ordinary muscle-massage is to be given then. After *luxatio obturatoria or suprapubica* the adductors are much stretched, it is true, but, as far as I know, massage is seldom called for.

There then remain to be considered here, luxations of the

shoulder, uncomplicated luxations of the elbow, in which both bones of the forearm are involved, and the less common patellar and meniscus dislocations in the knee joint.

Luxation at the shoulder, especially the sub-coracoidal and sub-glenoidal forms occur, as we know, oftener than all others put together. Father Hippocrates long ago recommended that gentle rubbing of the shoulder should follow reduction. Without doubt this may prove useful, and so may strokings over the joint itself, even during the first few days, but only in the position in which the joint has been fixed after reposition; therefore, the strokings should be given over the deltoid and from behind. For anatomical reasons, effleurage is never very effective here and one ought not to disturb the healing process by producing movements in the joints, particularly as it is a very easy thing to cause a new luxation thereby. Still, immobilization ought not to be protracted. After a week one may begin with a more extended massage and with cautious passive movements. In making the latter one should carefully raise the arm to the side of the head, otherwise movement in that direction, through the shortening of the teres major muscle, may remain incomplete for a long time or for all time. When passive movements are regularly given, the prohibition of active movements may be enforced without danger for several weeks.

Massage applied immediately after the reduction of luxations of the elbow-joint is of great service; it should be employed, however, only in those rare cases when the ulna and radius are dislocated forward without the occurrence of an olecranon fracture, or after the equally rare sub-luxation of both bones, one to each side, or after their luxation backward without fracture of the coronoid process. In one instance only of the cases last named, when I effected the reduction and applied massage very shortly after the injury, have I had occasion to use massage. In that case, however, massage was signalized by antiphlogistic and pain-deadening effects, such as we frequently see in cases of sprains. By making effleurage over the joint once a day in the beginning of these cases, we might greatly contribute toward a rapid and favorable termination of the process.

Meniscus-luxations in the knee-joint have been mentioned in all the larger surgical handbooks for a long time, although great uncertainty and great variety of opinions regarding them

has prevailed. Nevertheless, it is fairly well-established that this form of luxation, in the vast majority of cases, affects the inner and more mobile meniscus, which is usually forced thereby backward into the joint,* although the dislocation forward of the inner as well as the outer meniscus has been observed. For one who bears in mind the possibility of these rare luxations, the diagnosis is not a difficult one. The patient carries his limb in a half-flexed position; on account of the tension, there is constant pain in the cruciform ligaments and pressure on the alar and mucous ligaments, mobility is much restricted, and the whole outer picture reminds one of what is seen when a "*mus articularis*" has fixated a leg. Synovitis, with an accompanying effusion into the joint, always exists. At the proper seat of the meniscus, and upon the corresponding side of the patellar ligament, changes of form which are perceptible by sight and touch are present, since, when the luxation is inward, the capsule is drawn inward, and when it is outward, the capsule bulges outward. Finally, the absence of a "joint-mouse" strengthens the diagnosis. After we have effected reposition, the synovitis disappears quickly under massage. Since there is a tendency to relapse, operative measures have been resorted to recently (in Professor Annandale's clinic in Edinburgh) for the purpose of fastening the meniscus, now that opening the knee-joint is no longer the dangerous operation it once was.

I have seen very few cases of meniscus-luxation, and, with the possible exception of a doubtful case, only cases in which the

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* Dr. Evald Johnsen, the well-known masseur of Copenhagen, informs me that he has seen a considerable number of meniscus-luxations, and that in *all* the cases the inner meniscus was dislocated, which was thereby shoved backward into the joint. The outer meniscus may, however, be luxated, and the dislocation take place forward so that the meniscus presents over the tuberosity of the tibia and can be palpated between the condyle of the femur and its outer coverings (Erichsen, Berghman). W. Scott Lang (Internal Derangements of the Knee Joint, Edinb. Med. Jour., 1886, Dec., p. 517; 1887, Feb., p. 718; March, p. 760), divides meniscus-luxations into incomplete and complete of the inner or outer meniscus (the simultaneous dislocation of both was not observed), holds that the incomplete luxation of the inner meniscus forward is the most frequent (?), and thinks that it takes place when the leg is flexed and rotated outward, a position in which the meniscus becomes free from pressure between the tibia and femur. Reposition is made, when it is the inner meniscus that is dislocated, by flexing the leg and rotating it inward at the same time, and again extending it, while the rotation inward is prolonged. When the outer meniscus is dislocated, which always occurred during a flexion and inward rotation of the leg, it may be reduced by flexing and rotating the leg outward and extending it while in that position. This is the more difficult form of meniscus reposition, and must be made when the patient is narcotized.

inner meniscus was dislocated backward within the joint. The following is an account of a case on which I made notes:—

Arthur B., a bank officer, 26 years old, took a trip into the country on October 17, 1886. After dinner he jumped down into a pit, and felt a violent pain in his left knee, which instantly became stiff, and he had to be helped by his comrades to a wagon. On October 19 he consulted me. The patient holds his leg somewhat flexed, and states that he can neither bend nor extend it. When he limped into the room and made known his complaint I thought the case one of *mus articularis*. The left knee is perceptibly swollen; on the inner side around the internal lateral ligament is marked infiltration; a moderate amount of effusion within the bend of the knee; over the inner, anterior, and lower part of the capsule, corresponding to the anterior edge of the inner meniscus, is a low, but perceptible depression; and great tenderness on pressure at this point, but no trace whatever of a loose-body in the joint. As I saw that the patient was of an extremely excitable nature; after my examination, while he was lying on his back upon the bench, I grasped his left ankle with one hand, unobserved by him, and made a quick flexion and then a quick extension of his limb, whereupon, in spite of the patient's cry of agony, a perceptible scraping was noticed in the joint. The patient could, after this, both stretch out and bend the extremity, though, naturally enough, it was attended with pain; at the same time he was conscious of a change in the joint which caused him to pardon my treacherous assault, and the change of form had disappeared from the anterior part of the joint. Massage removed the effusion in two sittings; the infiltrate on the inner side yielded slowly, and the patient continued under treatment till, after twenty sittings, he was completely restored. Since then he has not had any abnormal feeling in the joint.

The most usual among the different forms of patellar luxation is the dislocation of the patella outward through a strong force from without; if we omit the habitual luxations which occur sometimes, especially in *genu valgum*. Herewith the patella frequently undergoes a movement about its vertical axis, so that its inner edge, or, as in the case reported below, all of its inner surface is directed forward and the outer edge touches the external condyle of the femur. In such a luxation we always have forcible stretching of the vastus internus muscle, with some rupture of its fibres of insertion and, very likely, rupture of the joint capsule too.

O. N., factory hand, 23 years old, on October 16, 1886, happened to get his right leg caught between a falling piece of machinery and a balance wheel, which latter caused a luxation of the patella outward, so that the bone simultaneously "faced about," and its posterior surface could be palpated through the tissues which covered it. Reposition was effected a few hours after the injury, the leg was splinted, and an ice-bladder laid upon the knee. After nine days the patient left his bed; on November 1st, two weeks after the injury, massage-treatment was begun. The knee had lost all semblance of its natural shape, owing to large infiltrates, especially in and around the inner and upper parts of the capsule. The whole lower part of the vastus internus and rectus femoris also felt hard and thickened; on the inside of the patella was a recent

scar several centimeters long and nearly one centimeter broad (from the wound made by the balance-wheel); no effusion in the joint; only about twenty degrees of flexion. The patient received frictions over the infiltrated parts, and vigorous effleurage and passive movements once a day for three weeks. The infiltrations were then much diminished and active movement was restored to somewhat more than a right angle, and the patient left the rest to time and his own private gymnastics.

We have thus far discussed that class of luxations which, with the exception of patellar luxations, are treated by means of massage immediately after they have been reduced, a class composed of comparatively rare cases for the most part. This is a faulty method of exposition that the reader will excuse. The luxations which usually occupy the masseur come first under treatment, long after the time of their reduction, and concern for the most part the shoulder-joint. The articulation has remained in a fixed position for too long a time after reposition; on this account, and because of the inflammation due to the injury, the capsule is much shrunken, and one has to do with a more or less stiffened-joint, spurious anchylosis, it may be, in which it is well nigh impossible to discover any mobility unless the patient is anæsthetized. In such cases the muscles, especially the deltoid, are somewhat atrophied. It is frequently advantageous to "break up" adhesions under chloroform, and thereupon treat the joint with effleurage and frictions, which latter must here, as in most cases, be performed with a certain degree of force. Usually, however, the problem we have in these cases is far from being so difficult as when we have to deal with more or less purulent joint-inflammations and with well-marked hyperplasiæ. We must not overlook the muscles, especially the deltoid and teres major, but should give them their share of massage, and gymnastics as well.

Mr. G. R. M., from Westmanland, 37 years old, fell from a wagon, August 28, 1886, and dislocated his left arm at the shoulder-joint. The day after, reduction was made; and the patient went about uninterruptedly for a month with the shoulder in a fixed position. When he attempted to use the shoulder-joint he found it completely stiff. Six weeks after the injury he consulted me, *i. e.*, on October 9th. The left shoulder showed a slight atrophy of the deltoid; on palpating this muscle a few small, very painful indurations were felt in its anterior part. In the axilla the capsule of the joint was felt to be perceptibly thicker than normal, and painful under pressure; no effusion. In the joint there was no mobility, or an utterly mimimal amount at the most; the scapula followed accurately the slight excursions of the upper arm. Under chloroform-narcosis, however, extensive movements were easily made. The patient was promised that he should again have full or nearly full use of his arm in a few

weeks. The treatment consisted of frictions in the axilla on the capsule, which at the outset was hard to reach, but gradually ever less so; massage of the deltoid by means of all the manipulations, including, especially, vigorous frictions of the infiltrates in its anterior part, and assiduous passive movements, which became more and more extended as the treatment progressed. By October 29th the patient had had thirty-seven sittings. On that date, all subjective and objective symptoms had vanished excepting some diminution in the upward stretch of the arm and a strong tension of the teres major, which could be felt when the arm was raised as far as it could be stretched. The patient returned extremely well satisfied to his country estate, and was advised to put up a cross-bar in the doorway of his work-room, and never to pass it without hanging from it for a minute or two by his relaxed arms, until he should be able actively to stretch his arms over his head as easily as he could before his accident.

Finally, as has been remarked, massage is resorted to in inveterate irreducible luxations, in order to counteract inflammatory processes in the accompanying false-joints, and to effect, in combination with gymnastics, greater mobility and a reasonable amount of functional power. In these cases the most important office of massage frequently is to counteract the attendant muscular atrophy.

Fractures in a Joint, or its neighborhood, generally call for massage as soon as the fracture is healed, since the functional power of the joint, even when there is no hindrance from callus-building, is generally markedly abridged through the effects of traumatic inflammation and of immobilization.

There is still a wide diversity of opinion as to the different forms of treatment in a certain class of fractures, especially as to the share and weight that should be accorded to massage and gymnastics, and also as to the proper time for employing them.

In the treatment of these, as well as in other cases, massage has not, in many quarters, attained the recognition and extended use to which it is entitled. On the other hand, in several places, even in the scientific world, the results obtained by a one-sided massage-treatment have been over-estimated, as it seems to me. In order to give my readers an idea of the part which may be assigned rightly to massage, it seems best to speak of its relation to the general treatment of a few of the most common forms of fracture involving the joints. As examples I choose those which occur in or near to the ankle- and wrist-joints. I shall dwell somewhat, besides, on patellar fractures, which, as I think, have been treated in a rather irrational way in recent years, in

certain quarters. The reader may acquire the necessary information regarding the technique, which, naturally, will vary in different cases, by reading over the general part of Chapter IX, and the section at its close regarding the massage of the individual joints.

It is a highly remarkable, but by no means, pleasing fact that the ordinary simple fractures, *i. e.*, "Colles'" and other fractures which occur in the neighborhood of the wrist-joint, or even within the same, are still, by certain practitioners, always treated by means of plaster-bandages. This treatment ought to be characterized, perhaps, as absolutely blameworthy, for the reason that the plaster-bandage, which besides being difficult to apply is, as regards this fracture, wholly unnecessary. It frequently causes "nutritive" shortening of the muscles and severe functional disturbances in the fingers, and also in the wrist-joint; sometimes the latter may prove intractable to all treatment, especially among elderly people. They are very detrimental to the patient, whereas they might be avoided easily and safely by a more rational course of procedure. Here, in Stockholm, these fractures are treated, generally, as follows: a well-padded, pistol-shaped splint is applied, by means of a roller-bandage, in the usual way. *The splint stops short of the metacarpal phalangeal joints so that the latter remain free; which condition is necessary for the thumb also.* The patient has to retain the splint without interruption for five days, or seven days at the most, and is admonished to indulge in active and passive gymnastics of his fingers during all that period. After that time the bandage is removed, preferably every day, in order to admit of careful but fairly energetic effleurage of the forearm, to which similarly cautious passive movements of the wrist-joint are added according to the measure of the healing of the fracture. After each massage-sitting the splint is replaced, and, under ordinary circumstances, is kept in use for three or four weeks. At the expiration of that time the extremity is left free without causing detriment to the residue of the healing process or to callus-building. The slighter disturbances of function that persist after such treatment, which seems to me a rational treatment, always yield to continued massage and gymnastics in a comparatively short time.

In those fractures which occur in or near to the talo-crural

joint, massage, and other treatment, varies much, according to the nature of each particular case. If the fracture is one of the fibula alone, then the plaster-bandage oft-times may be dispensed with entirely, and sometimes the use of the joint need be interdicted for a short time only. Berghman and Helleday mention a case treated by Mezger, wherein the seat of the fracture was four finger-breadths above the malleolus; the distance between the malleoli was increased by about one centimeter, and a perceptible pronation-position existed. The patient consulted Mezger when the injury was twenty-four hours old. He was treated thus: the swelling was massaged; the foot was redressed and fixated by means of a tightly applied roller-bandage; and the patient was forbidden to rest his weight on the injured limb. After three sittings, all swelling and nearly all pain had disappeared; and after three more sittings (that is four days after the injury, probably*) the patient was allowed to walk and to bear his full weight on the foot. After two more sittings the massage terminated, and the patient was advised to wear his bandage for a fortnight longer. The position of the foot remained normal, and when, at the end of a month, the patient showed himself again, he had not the slightest inconvenience left from his accident.

I have cited this case to show how fortunately a course of procedure, which seems to me a very bold one, by reason of the extreme brevity of the immobilization, may turn out. In many similar cases the course of events might not have been so satisfactory, and the treatment might well, without any other modification, have included a more protracted rest of the joint. Perhaps, too, the case is not a fair example of Dr. Mezger's usual method. If the fracture occur in the neighborhood of the joint, then he does immobilize the same in most cases, and his treatment more nearly resembles that which is usual. Nevertheless, there is no doubt that the immovable bandage may be dispensed with in slight cases and a roller-bandage substituted for it.

In severer fractures, such as Pott's and the like, which involve tibia and fibula, immovable bandages cannot well be avoided; and we shall do best if we postpone real massage until the

* Mezger usually gives two sittings daily, each being six to eight minutes.—Berghman and Helleday.

healing is well advanced, whereby the possibility of a future faulty position of the foot will be surely diminished. When there is much swelling the use of ice and the raised position is to be commended, for one or two days, until the fixed dressing is put on, and thereby one may readily spare the patient effleurage above the seat of fracture for the purpose of promoting resorption. If the swelling be moderate then the foot is redressed during chloroform-narcosis, the plaster-bandage applied, and, for from four to six weeks, renewed on every eighth day. At every renewal of the plaster-bandage careful effleurage should be performed and passive movements imparted to the joint; these are to increase, as to force, with the progress of the treatment. During the last stage of the treatment it may be advantageous to substitute a capsule, that may be put on and off, for the plaster-bandage, in order to facilitate daily massage and gymnastics. We continue the latter, even after the patient has begun to use his limb, until its soft parts and functional power are fully restored to the normal.

The following may serve as an example of an intra-articular fracture:—

V. D., twenty-six years old, a court-coachman, fell under a horse, on October 17, 1883. On his arrival at the Seraphim Hospital (in Stockholm), on the same day, both bones of the left forearm were found to be dislocated backward; the humerus was fractured, a little way above the epicondyles, and both of the latter could be felt to be quite free from each other (a T-shaped fracture); swelling and sugillations were excessive. The fracture knit in three weeks, leaving the arm at the joint and in its immediate neighborhood wholly shapeless by reason of a hard œdema and extensive infiltrations. Vigorous effleurage and frictions were begun at once, and continued daily. November 19, I "briséd" it, without chloroform, to a right angle and to almost complete extension. Soon after the soft parts had become more nearly normal, under massage, I felt a mass as hard as bone on the inner side of the humerus, five centimeters above the internal epicondyle, which I at first took to be a part of the callus; it was not fast, and I was able soon to palpate a bit of bone, about six centimeters long, and several millimeters thick, lying under the brachialis anticus muscle on the anterior surface of the humerus and separated from it. It was loose at its top and was movable from side to side. As its lower end was within the joint, I gave up the idea of making it completely mobile, and an operation on the same ground was not to be recommended. Massage was continued, one sitting daily, till the middle of February, when the soft parts had become wholly normal; active flexion passed somewhat beyond a right angle, and the passive amounted almost to 70°; of extension, active and passive, an insignificant angle was lacking. Two years later I had news of the patient to the effect that he could use his arm well. "He could feed himself, but could not blow his nose" with that hand.

We come now to patellar fractures, which, at present, are treated by some physicians, especially in Scandinavian countries,

though also by some German practitioners, in a very peculiar way, which will engage our particular attention at this point. To begin with, not only the osseous but even a possible intimate fibrous union of the patellar fragments is disregarded. The first stage of the treatment consists of rest, ice, and massage; at the end of six to eight days, the patient must get up and walk, having a restraining bandage around the knee; massage and gymnastics are continued at the same time, so that in from two to three weeks the patient, if he be in a hospital, may be discharged, with his functional power more or less completely restored. (Hygeia, 1879, p. 95. Rossander and Berghman.)* In justification of this so-called Dutch method, the following claims are put forth: it removes hyperplasia; forestalls excessive shrinkage of the capsule as well as the adhesion of the upper fragment of the patella to the anterior surface of the femur (a condition that naturally destroys the function of the quadriceps femoris as an extensor of the leg); it calls for the sacrifice of far less time and patience on the patient's part, than that form of treatment which assumes the difficult and hitherto rarely successful task of securing bony union; and, finally, it is claimed that this treatment has a far greater merit than those just noted, namely, of securing particularly satisfactory results in the restoration of functional power.

I shall endeavor to show how far this method is deserving of renown for the last named result; and shall at the outset describe the case which has furnished the principal reason for the spread of this method. I cite this case more readily, as I have had the opportunity of examining it critically twelve years after the fracture occurred. The case which was treated by Dr. Mezger, of Amsterdam, is an exceedingly interesting one from various points of view, and has figured largely in the literature of the subject, in versions that were more or less accurate reproductions of the original report in "Hygeia." I reproduce the account of it below, with some condensation. It concerns a prominent officer of the Swedish army, Baron S.

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* After the manuscript of this chapter had been prepared, I had the satisfaction of hearing from Professor Rossander that he had changed his opinion concerning the advantageousness of this method of treatment, as it is here described and was originally employed by him. The method thus loses its foremost advocate, and may well, before long, cease to have any rôle to play.

Baron S., then thirty-four years old, on June 24, 1875, fell against a stone and incurred a fracture of his right patella, which was treated in the usual way, by means of ice-bladders, fixation of the joint, etc. October 25, the patient consulted Dr. Berghman, in Stockholm, who found a ligamentous union about two centimeters broad, between the two movable fragments; no exudation in the joint; marked hyperplasia in the capsule and its neighborhood; marked atrophy of the musculature, especially of its anterior portion; and an *anchylosis spuria* within the knee-joint. At the end of three months' treatment (two sittings daily?) there was no pain in the joint; the hyperplasia was diminished; practically speaking, there was no gain as to functional power; and the leg could only be bent passively to an angle* of 121°, when Dr. Berghman employed considerable force. Dr. Berghman saw no prospect of gaining more by a continuance of the treatment, and advised the patient, who was about to make a journey on the continent, to call on Dr. Mezger, in Amsterdam.

February 1, 1876, the patient consulted Dr. Mezger in regard to the knee-affection, now more than seven months old. Dr. Mezger, however, was of the opinion that the case had little hope of an improvement of function and declined to undertake its treatment. Poor Baron S., for whom this meant an end of his military career, repaired to his hotel, fell down stairs, happily for himself, struck his injured knee-joint once more, so that a severe inflammation and an effusion of blood took place within it, and a small portion of the upper fragment of the patella was split off besides. Dr. Mezger was called, and explained, as soon as he had finished his examination, that the conditions were now changed, and undertook to give the patient a serviceable knee-joint again.†

Baron S. kept a diary relating to the treatment, from which we derive the following: Mezger visited the patient on the same day that the injury took place on the stairs, and bandaged the knee with a woollen roller "after he had manipulated it somewhat to set it right." The next day the bandage was changed and the patient himself made some movements with his leg, which were repeated later. On February 3, two days after the injury, Mezger made light massage once; "it felt unpleasant." February 4, painfulness was less, the massage was performed more forcibly and "caused much pain;" and the patient was told to hang his leg over the edge of the bed every second hour, so that the leg might be bent by its own weight and the fibrous band between the fragments of the patella be stretched. February 6, the patient began to walk about his room with the assistance of an arm and a stick. February 9, the patient went by himself to Dr. Mezger's office; the knee could be bent, with-

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* Mezger and his pupils make use of an apparatus, that affords accurate measurement of the angle of flexion, which, although it may have little value in practice, may possess interest in many cases.

† Why, asks the reader, did Dr. Mezger change his prognosis so radically after the injury received on the stairs of the hotel? One who knew the outlines only of the case might, perhaps, conclude that the upper fragment had grown fast to the femur (in which case, though there might be some passive flexion allowed by the fibrous union of the fragments, still, owing to the abolition of the extensor action of the quadriceps femoris, all functional power would be lost), and that this fragment was loosened by the new injury. But such was not the case. Berghman expressly says that both fragments of the patella were movable before the patient went to Amsterdam. Therefore we must seek the ground of Mezger's change of views regarding the prospects of the case both in the acute inflammation called forth by the trauma, which promised to further the removal of the residual old hyperplasiæ, and in the effusion found in the joint, which had the effect of stretching the much shrunken capsule.

out difficulty, to an angle of 117 degrees. February 10, the patient received a peculiarly constructed chair to facilitate the bending of his knee. February 13, the patient discovered that he could walk better than he could previously to the second injury of his knee. February 15, Mezger employed tapotement, besides the usual manipulations, making use of both the rubber and metal ends of a percussion-hammer. Mezger had remarked before, February 8, when the effusion had nearly disappeared, "the healing proceeds too fast, so that the flexion cannot keep pace with it." After this tapotement was frequently employed, so that an effusion was thereby maintained in the joint, which, as Mezger informed the patient, was favorable to the softening of the stiffened tissues and the freer mobility of the fragments. Flexion had meanwhile made good progress, and the right angle was reached on March 7. From then on the treatment was also directed toward overcoming the atrophy of the muscles, both by means of electricity and tapotement. The latter was given so forcibly that on March 4 the patient notes "that he had such a thrashing that he could hardly walk the whole day." Forced flexion, which had been discontinued after a right angle had been attained, March 7, was resumed March 29. The patient was treated by Dr. Mezger till April 19, and in May again called on Dr. Berghman, in Stockholm.

In the examination then made, it was found that scarcely a trace of hyperplasia remained, and that the patient could easily crook his leg as far as 85°; in which position the distance between the two larger patellar fragments was 10.5 centimeters. Extension was incomplete, by an angle of 18°, in which position the distance between the fragments was 1.5 centimeters. The gait was quick and light, "and only a slight unevenness could be discovered in it, when the patient walked fast." The patient was not conscious of any tendency in his knee to give way now and then, and had noticed only that his injured leg tired sooner than the other. Dr. Berghman held that the unevenness of the gait "was due entirely to the still existing atrophy of the muscles of the thigh;" he was rightly astonished by the remarkable result, and resolved to resort to the same kind of treatment at the first opportunity, "especially in recent fractures, where, from the absence of old residues from inflammation and of stiffness of the joint, there would be less difficulty than in the case just considered."

On January 18, 1888, when I had read over this chapter again (in the illusory hope of having this work immediately ready for the press), I betook myself to Baron S., who is a personal acquaintance of mine, in order to ascertain the present condition of his injured limb, and he very courteously allowed me to examine his famous knee-joint. I found it, as Dr. Berghman had described, with the single exception that the distance between the larger fragments of the patella was greater when the limb was fully extended, being now about 3 centimeters; active extension was incomplete by an angle which seemed to me, when measured by the eye, to be considerably more than 18°. Flexion had become more considerable and there was only a very small angle left, through which the limb could not pass. When flexed to its maximum, the distance between the fragments of the patella was slightly greater than before, being somewhat over 11 centimeters. The atrophy of the muscles of the thigh was noticeable, but not very considerable; the greatest difference in circumference as compared with that of the left thigh was two centimeters. Function not a little restricted. S. could walk fast very well, but not run; even at an ordinary gait the unevenness in the walk appeared, which Berghman* mentioned, and which I have

* This unevenness does not depend exclusively, as Berghman thought, or even chiefly, upon the atrophy of the muscles, but, without doubt, rather upon the presence

often noticed in S.—it consisted of swaying movement of the leg. The limb is somewhat "uncertain." S. feels always that "he cannot quite rely on it." Before I put the question, he informed me that when the leg reached a certain degree of flexion, it "would give way" under him. S., who is now the head of a regiment, performs his military duties without trouble, can take long walks, and sometimes goes hunting; then he uses a cane.*

This is about what might be expected. No leg can functionate normally when so long a section of extremely extensible material is inserted, in the place of muscle-substance,† into the extensor apparatus of the lower leg. If any one had both his legs thus affected he would suffer, without doubt, very serious inconvenience therefrom. The walk would resemble that of an ataxic person, the tendency to fall be very great, extension would necessarily be incomplete, and so, too, the power of control over flexor movements. Such an individual would "seat himself," whether he wished to or not, with a peculiar velocity bestowed by the power of gravity, as soon as his legs were much flexed. Without doubt even the atrophy of the quadriceps would be maintained by the presence of the ligamentous union and the accompanying restriction of muscular activity. If only one leg is damaged thus, then the other naturally acts vicariously for it many times, and disturbances of function, even if they are always prominent, will be more readily borne.

Mezger's result, without question, was a brilliant one and entirely such as we might expect of the justly admired Dutch masseur, *in this particular kind of case whenever the conditions of the knee-joint are such as they were when he undertook the treatment of this case.* But is it right to follow such a method in *recent* cases of patellar fracture? Unfortunately I am not competent to decide what is the best way of treating a patellar fracture from the beginning. But it is perfectly plain to me, by

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of a long, fibrous, extensible, and elastic connecting band between the two patellar fragments. A well-marked muscular atrophy may, indeed, give rise to swaying movements; but I doubt if such was the reason for the slight unsteadiness of movement that existed in this case. Moreover, I can show cases of as well-marked atrophy of the musculature of the thigh, in which there is no trace whatever of "swaying."

* Hünerfauth, who cites this case (his oft mentioned "Bergham" being Berghman), asserts, categorically, that the functional power was "normal," after Mezger's treatment, a statement which, like some others of the same author, must be taken with a considerable degree of allowance—which statement, I suspect, was snatched out of the air—since no one else, so far as I know, has given such an *à priori*, fanciful account of the case in question.

† The quadriceps muscle becomes shorter in such a case, in proportion as the distance between the patellar fragments is increased.

reason of this and other cases, and by reason of facts to which no objective critic can shut his eyes, that the way to a satisfactory result is closely dependent upon the firmest and closest possible union between the fragments, and that any form of treatment that disregards such a union ought never to be resorted to except in cases of extreme need.

It by no means behooves us to give up the hope of good results from a sure, though difficult, method of attaining the so long and vainly sought bony union of the patellar fragments,* without incurring the danger of other troublesome results which may arise from too protracted an immobilization. Even when such a bony union cannot be established, we should make it our aim to bring about the union of the fragments by means of as short and firm a band of fibrous tissue as is possible. To be sure the disturbances of function vary greatly in individuals having ligamentous bands of the same length; but, *ceteris paribus*, these disturbances will be greater the longer the bands are. At

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* Schede's treatment (as he has expounded it in the *Centralblatt für Chirurgie*, 1877, No. 42) seems to me to be extremely rational. Schede punctures the injured joint with a coarse trocar (just as when the præpatellar bursa is filled with blood); washes it out thoroughly with 3 per cent. solution of carbolic acid; fits the patellar fragments carefully together; and fixates them by means of strips of adhesive plaster, three cm. broad, laid shinglewise over each other—the same are also laid over the antiseptic dressing above the wound. The strips for the upper fragment cross one another in the hollow of the knee and on the calf, and pass thence to the anterior surface of the lower leg; while those for the other fragment encircle the thigh in a like manner. A flannel roller-bandage is then accurately laid-on without any cotton-batting, over the whole, being given a "Testudo-shape" over the knee, and, finally, as tight a plaster-bandage as may be is applied to the entire extremity, which is, of course, fully extended. This dressing is replaced in a week, at the latest, by another of the same description, and the change of bandages, to which Schede attributes the utmost importance, is repeated once, at least, oft-times twice, after a week's interval. The entire period required for the plaster-bandage treatment is six weeks. When the bandage is changed the utmost care is called for to secure uninterrupted and complete extension, and to keep the patient from letting his quadriceps femoris come into play. The after-treatment is so managed that the patient wears a splint reaching from the foot to the hip, and furnished at the knee with a joint that permits not more than twenty degrees of flexion at first, and later, at intervals of a month, permits of gradually greater freedom of movement. For the first four to six months the apparatus is not removed; then massage and a careful gymnastic treatment are simultaneously begun. Schede declares that only when *all* the requirements of this method are fully complied with is the bony union secured—a result which is in some few cases not attained even when the method is consistently followed. At the time Schede's article was published a year and a half had elapsed since the injury in his first case, and the man concerned had full use of his extremity at that time: the thigh was "just as strong and active as before (the accident), the patella presenting perfect bony union." What a far different condition would the patient be in if Schede had not striven to obtain a better result than can be attained by a one-sided massage treatment!

a later stage massage is of great service in restoring the soft parts of the joint to their normal condition; in counteracting the atrophy of the quadriceps; and in lessening the task of the gymnastic treatment, which must be carried out with much circumspection so long as the fibrous band is still new and easily stretched.

We shall say very little about fractures of the olecranon. Here too massage is not indicated till the fracture has become united, whether the union be a fibrous one, taking place under ordinary treatment in full extension * with bandages of adhesive plaster and gypsum, or whether bony union has been attained. In the great majority of cases there is no difficulty in restoring the full functional power of the limb, by means of massage and gymnastics, in a comparatively short time; but here, just as in patellar fractures, it is of the utmost importance to proceed most cautiously with the passive-movements.

In a case of olecranon-fracture that I have had under treatment recently, I have striven, by means of energetic frictions and effleurage, to render the capsule and the much infiltrated soft parts as normal as possible; through careful gymnastics, I have slowly brought the arm to a right angle, always paying scrupulous regard to the ever scarcely discernible seat of fracture; after that, I leave the conquest of the lacking amplitude of movement to the lapse of time, and forbid the patient to seek to achieve it by too vigorous active movements, for some weeks.

After the foregoing, we do not need to say much in addition about massage after other injuries to the joints, or after different operative invasions of them (especially after resections,—in those joints, namely, where the operation does not aim at a bony union between the ends of the bones). Just as modern antiseptic treatment (even in those cases where penetrating wounds or other factors have caused purulence), has increased the probability of our being able to save the joint from complete destruction; so a more rational use of mechano-therapy has

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* Schede makes use of repeated change of fixed bandages in cases of olecranon-fracture as well as in patellar fractures, and for precisely the same reasons; and holds that puncture, and washing out, is useful in the less frequent, though greater effusions which take place in that joint. Slight passive movements of the joint are made at the times of changing the bandage.

strengthened our claim, that we can restore to patients the use of their joints, even in severe cases. In every case, the weighty rule holds good not to consider the joint alone when using massage, but the muscles as well, when necessary, and not to be a one-sided masseur but to assign a reasonable share of the treatment to gymnastics and orthopædics, just as to every other proper form of therapy.

CHAPTER XI.

NON-TRAUMATIC JOINT AFFECTIONS.*

Acute Serous Synovitis.—Acute serous synovitis has been discussed by us already among simple traumatic joint-affections, which usually belong under this head during their early stages. Here again, effleurage is the sole manipulation adapted for use during the acutest stage; in proportion as the intensity of the process abates, and above all when it shows a tendency to become chronic and delay resorption, frictions are introduced into the treatment. Treatment is best conducted by holding several sittings daily, till full restitution is achieved. In a purely serous synovitis, besides massage no other treatment, but rest, and the use of warm wet compresses, is required.

Acute purely serous synovitis often runs its course easily and quickly. In the numerous transition-forms to more severe inflammations the process is prolonged; and the more nearly the case approximates to a sero-fibrinous, or sero-purulent, "catarrhal" synovitis, with its tendency to involve all the articular and even the periarticular parts in the process, by so much the more is the course of the inflammation prolonged,

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* Out of regard for practical considerations, I have followed the general usage in distinguishing traumatic from non-traumatic joint-affections. As to the latter, since it is impossible to proceed consistently with a pathological or any other principle of classification, I have classed the purulent, sero-purulent, and sero-fibrinous joint-inflammations together, reckoning the so-called metastatic ones among them, as well as those which occur in acute, febrile articular rheumatism, which is now generally held to be an infective disease; but I would point out, at the same time (see p. 158) the great changes which take place in respect to the character of the exudation and the pathological changes as well. This seems to me more justifiable than to place together acute febrile and chronic articular rheumatism, with their widely different forms, which could scarcely be discussed under one head, if they did not have the same inappropriate designation of "rheumatic," in common. The circumstance that the first may be followed by the second, does not impel me to consider such a grouping as any the less arbitrary. Every one of us knows that a simple traumatic synovitis may be followed by tuberculosis of a joint (and may with some degree of probability be said, in a certain sense, to cause it); still it does not occur to any one that they belong to the same class. If we would be consistent, we should also be obliged to class among joint-metastases, the light cases of synovitis, which occur at the beginning of the "secondary" stage of syphilis. However, as has been said, we should not aim too inflexibly at consistency, in the classification of joint-affections.

and massage as well as the rest of the treatment resembles that which is set forth below for the typical forms last mentioned.

Perhaps this is the best place to speak of the importance of massage in the treatment of the rather rare intermittent forms of synovitis, which return periodically after short intervals, and which are ascribed by recent writers, with probable correctness as it seems to me, to disturbances of the vascular nervous system. I have treated only two such cases, which much resembled each other. In one case, the patient, a man of middle age, could not come regularly for treatment. So I gave it up after a few days. In the other case, a fairly good result was achieved.

Miss R. F., about forty years old, was small, lean, rather "nervous," but otherwise well, the absence of intermittent symptoms and menstrual difficulties being especially noted. She has suffered, for the last few years, from a joint-inflammation that recurs every ten or eleven days. It reaches its acme in a few hours, and then gradually disappears completely in the course of a few days. On the first day of an attack, the patient feels poorly, is chilly, has nausea, and sometimes vomits; the joint swells considerably, and she becomes unable to bend the limb, and, on account of the violent pains, is hardly able to walk. After some four or five days, the symptoms all pass away, and the knee functionates normally again, till the process is repeated when the time comes round. When she consulted me, in February, 1886, the knee was almost normal; in the outer, anterior, and lower parts of the capsule there was considerable thickening, and an insignificant diffuse thickening over the entire capsule. The patient was given vigorous frictions over the whole anterior part of the capsule, but chiefly over the infiltration mentioned, together with effleurage. After a few days an attack came on, and the capsule became enormously swollen throughout its whole extent; walking became extremely difficult, and she held the limb continuously extended; in spite of which she declared that the attack was milder than usual. Massage was given once a day, for forty days, even when she had an attack, which became lighter every time it recurred. The last attack was limited to a scarcely noticeable stiffness of the joint in the morning, *while the general symptoms were much as usual.* The patient then returned home somewhat sooner than seemed to me advisable. I have heard since that the attacks gradually developed again, but without causing so much trouble as formerly, till, a few years subsequent to my treatment, they ceased spontaneously.

Obviously, no definitive conclusions can be drawn from the foregoing solitary case; still it would appear that massage, besides being able to remove the inflammatory changes which gradually arise in these intermittent cases of synovitis, has some power of influencing vascular neuroses.

Chronic Serous Synovitis.—Simple chronic serous synovitis is familiar to every masseur, under various forms. In some of these, massage, when properly given, leads to restitution; but

we must admit that in other forms, an exclusive massage treatment often fails us.

The most amenable cases which, like most forms belonging to this category, relate to the knee-joint, belong to the numerous class of simple synovitis, which we often hear called "capsulitis" by physicians who are familiar with massage, and are quite too little noticed, as I think, in the handbooks. Objective changes are so insignificant in these cases, as sometimes to escape detection, when inspection is made: in other cases, when comparison is made between the injured and normal joints, some change of form is observable, on one side or the other of the patella, in front of the alar ligaments or along a greater or lesser portion of the anterior edge of either meniscus; in the joint cavity there is little or no increase of synovial fluid. We must subject all that is accessible of the capsule to a minutely careful palpation in every case, in order to discover changes that are often hardly perceptible, and to obtain full knowledge of the case. Not infrequently the subjective, in comparison with the objective, troubles are surprisingly great; and it can hardly be doubted that a very large percentage of the so-called joint-neuroses belong to these circumscribed simple cases of synovitis. In most cases, these affections yield completely to forcible frictions and effleurage over the altered parts. The duration of treatment may vary exceedingly, according to the situation of the infiltrate, and the degree to which it is accessible for frictions. It is important that, during massage, the joint should be held in that position which favors the most energetic and extensive influence of the manipulation upon the altered parts of the capsule.

P. B., forty-four years old, a manufacturer, presented himself, February 2, 1887, and complained of pain in his left knee-joint, which had troubled him for a few months whenever he moved about, and ceased to do so only during the night. In spite of which the patient had walked the considerable distance between his residence and mine. The patient is very thin, so the examination is easy; nevertheless inspection shows, on comparing the two knees, only a barely perceptible greater fullness over the left knee, on the outer side of the patellar ligament, immediately above the edge of the tibia. On palpation, at which the patient shows a tolerably pronounced tenderness to pressure, a slight thickening of the capsule is felt. The most scrupulous examination discloses no other alteration whatever, and, least of all, an increase of the fluid content within the joint. Mobility is complete; in full flexion there is a little pain. Frictions are applied to the seat of the alterations; and the patient has to use a woollen roller-bandage by day, and warm wet compresses at night. He received massage once a day for twenty-two days; whereupon the subjective and objective symptoms of his joint-trouble disappeared.

Even when there is an increase of synovial fluid (with floating of the patella when the knee-joint is concerned), and usually, too, in moderately diffuse thickening of the capsule—a typical hydrarthron—massage often produces good results, particularly if the cases are not of too long standing. In such cases massage consists of *vigorous tapotement over the joint with the flat of the hand, forcible friction over the anterior part, and energetic effleurage over the popliteal space.* In other cases, which make up a very large minority of hydrarthron cases, and always represent the extremely "torpid" forms, massage is of no avail whatever; "the water on the knee" persists obstinately or returns after occasional resorption. It *never* repays one's trouble to treat such processes with light manipulations. If we desire any prospect of success we must engage in pretty active work, and the patient will have to undergo considerable pain.

Miss X., from Norway, rather more than twenty years old, felt slight tingling pains in her right knee for some two years, and noticed that it was swollen and easily tired. Her humane old family physician gave her massage for several weeks, concerning which the only information attainable (though it was quite sufficient) was that it had "tickled terribly." Miss X., who was visiting in Stockholm, was given massage seventeen times in eleven days; it was not of the "ticklesome" sort, but was decidedly painful, on account of the tapotement. She was by this treatment relieved of her joint-trouble, and has continued free from it till now, a period of several years.

If we do not attain a definitely positive result after a few weeks' vigorous massage-treatment of a hydrarthron, during which a woollen bandage by day and warm compress at night are the only additional procedures, then we must give up the hope of succeeding by such means. We must then consider the advisability of puncture and washing out (see p. 133); in performing the latter it is best to use a fairly strong, say three to five per cent., solution of carbolic acid with a Dieulafois' aspirator. For a few days subsequent to the puncture, and the more or less violent inflammatory reaction resulting from it, we let the joint rest under a light compressing, antiseptic bandage. Then, after a little, we may assist restitution (which is often spontaneously complete) by means of frictions and effleurage. Forcible compression seldom need be considered, since the comparatively mild treatment alluded to enables us to attain our end with tolerable certainty.

Purulent and Sero-Purulent Inflammation of Joints.—Sero-purulent, sero-fibrinous and purulent joint-inflammations arise, as we all know, after penetrating wounds, through puru-

lent processes in the neighborhood of the joint, after careless soundings in the urethra, during the course of infectious * diseases, and finally without any assignable cause.

I have nothing to do here with the variable forms of treatment during the florid phase, viz., rest, combined with ice-bladders, puncture with washing out, and draining of the joint in purulent cases. Massage is first indicated when the process has terminated, or at least has entered upon its torpid phase. Although it is a mistake to begin massaging a joint so long as a purulent exudation exists in it, or while the fever-stricken patient requires uninterrupted rest, or when the patient's general condition, in early convalescence from a severe infectious disease, is too reduced to permit his undergoing, without damage, the severe pains which massage often calls forth in cases of this kind; we may well bear in mind that it is also a very serious shortcoming, oftentimes, on the other hand, to postpone massage longer than is necessary. Nor should we forget that the more promptly frictions begin, which are the chief manipulation here, so much the less will there be of organized connective tissue; so much the quicker and easier will be the resorption of infiltrates and hyperplasiæ; and so much the shorter will be the time that the articular parts, and the muscles will suffer from restricted mobility. Among physicians the mistake of beginning with massage too late is of much more frequent occurrence, I am convinced, than of beginning it too soon.

One must exercise caution in forming a prognosis, and take all the circumstances into consideration: the progress of the process in the joint, its present condition in all its details, the changes in the muscles, especially contractures, the age of the affection, as well as that of the patient, his general condition, etc. Chloroform-narcosis enables one to obtain valuable data,

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* The so-called metastatic articular inflammations, which occur in infectious diseases, may vary indefinitely in their pathological characteristics. Nevertheless it may be of interest to recall the fact that they vary most (being now predominantly serous, now purulent), in scarlatina, diphtheria, measles, inflammation of the lungs, typhus, mumps, gonorrhœa, and erysipelas; that they are usually serous in whooping-cough, dysentery, ague and rheumatic fever; and are usually purulent in small-pox, glanders, puerperal-fever, septicæmia and pyæmia (Schüller). Herein we may find some, though no very decisive, support for our prognosis. I have had personal and gratifying experience of the entirely complete resorption of a large articular exudation, which may often occur in severe pyæmia, without any special treatment. On the other hand, we have all seen how badly-disfigured joints may become, when attacked by articular rheumatism.

as has been said on p. 121. In general, it may be said that massage and gymnastics enable us gradually to restore a reasonable amount of mobility to the joints, in all cases where there is no anchylosis, where the cartilage is measurably undisturbed, and where the muscles have not undergone too much shortening. Nevertheless, sometimes years may elapse before the joint, through the agency of nature and of daily use, regains its full and normal functional power.

So far as the technique of massage treatment is concerned, I need say nothing here, since I have described it with sufficient fullness, in its relations to the more severe joint affections, in the general part of this chapter. (See p. 123.) I would remind the reader once more how necessary it is not to be simply a masseur and gymnast, and as such neglect other remedial measures, but to make use of orthopædics for the purpose of stretching shortened muscles; to introduce into the treatment influential agencies for promoting resorption, such as wet warmth-producing compresses, hot mud-baths, and douches; and also, when it is necessary, to have regard to the general health, whose condition is of the utmost weight in determining the prospects of the joint itself.

I cite the following three cases as representatives, respectively, of marked hyperplastic fibrinous synovitis, of metastatic sero-purulent synovitis, and of what is probably a still more purulent form of synovitis:—

1. A. K. J., 22 years old, a farmer's daughter from Södermanland, who never suffered from scrofula or had any urethritis, and enjoyed blooming health, was attacked suddenly one night in September, 1883, by extremely violent pains in her right knee, which swelled badly. The patient felt quite ill and had some fever. A few days later, on September 27, she entered the Seraphim Hospital (in Stockholm) and was treated by means of immobilization and ice-bladders. At the end of February, 1884, I saw the patient in that hospital. All effusion had vanished from the knee; the capsule, whose anterior border was quite perceptible on inspection, was felt to be enormously swollen and hard, especially in all its outer part; scarcely a trace of passive mobility in the joint—of active mobility not a trace. A colleague declared that the case could only terminate in anchylosis. I determined to make good my own contrary opinion, and for eleven weeks, so long as I could stay in Stockholm, gave the patient an energetic sitting, once a day, of vigorous frictions and effleurage, and passive movements, proportioned to the diminution of hyperplasia in the capsule; beyond these only wet warmth-producing compresses were employed. After about a fortnight's treatment, the hyperplasiæ of a large part of the outer side of the joint all at once became noticeably softer, and improvement proceeded rapidly for the next few weeks. When I was obliged to break off the treatment, in April, the hyperplasia had mostly disappeared, though the capsule still felt somewhat thickened; active mobility, as far as a right angle, had been regained; the passive mobility was somewhat greater than the

active; the patient found walking difficult by reason of the pains she still felt. The patient was not dismissed from the hospital till June 21, when there was a little stiffness remaining in the joint, which, doubtless, soon recovered its full power of motion.

2. Gustaf A., 23 years old, contracted a gonorrhœa at the beginning of November, 1887, which was treated with injections of different solutions. On November 26, his right knee-joint began to swell; the knee felt burning hot; the patient had light fever; and an inflammatory contracture developed rapidly in the leg. The patient had to go to bed, and use an ice-bladder. December 8, the joint was opened, the sero-purulent exudation washed out carefully with a three per cent. solution of carbolic acid and an antiseptic bandage applied. December 12, a pericarditis set in, which ran its course harmlessly. Massage was first given January 15, 1888, when the patient had recovered from both gonorrhœa and pericarditis, and when the incision-wound, which had remained open a long time was healed; besides massage, wet warm compresses were employed. In the joint some slight exudation was found; the capsule was unevenly thickened by not very hard hyperplasiæ; the leg could be bent passively, though not without much pain, to an angle of about 140°. Under vigorous frictions and effleurage, given daily, and gymnastics, the exudation disappeared, the hyperplasiæ were diminished, and the mobility increased with surprising rapidity. On February 8, the treatment was concluded. The patient can now actively bend his leg through considerably more than a right angle; at the point of maximum flexion the different parts of the quadriceps femoris are felt to be extremely tense; the remaining limitation of flexion is doubtless due mostly to the shortening of the quadriceps, and will be overcome only very slowly. The patient was advised to gymnasticize industriously, to use warm water compresses at night and woollen bandages, by day, over the knee until complete recovery should be attained.

3. Dr. E. K. (myself), thirty-five years old, during dissection in an operative course in Vienna, contracted infection from cadaver-poison, through an unnoticed scratch on the forefinger of his left hand, on April 6, 1882. On the same day a violent general sepsis declared itself. After extirpation of the swollen glands in the left axilla, pyæmia set in, with metastases in all the extremities (but the left arm), with a considerable left-sided pleuritic exudation (which was resorbed in the course of a few weeks), as well as effusions in the left knee- and left tibio-tarsal joints. The patient pulled through (despite a unanimous sentence of death), by the aid of febrifuges, excitants, nourishing easily-digested food, and a strong desire to live. I pass over the different phases of the process in order to treat particularly of the fate of the two joints above mentioned. There was an abscess in the vastus internus, some centimeters above the knee-joint, which burrowed to the periosteum and downward as far as the knee-capsule: at the same time the joint was tightly filled by an exudation. After the abscess in the muscles had been emptied (and an antiseptic compressive bandage applied at its site), the effusion in the joint was spontaneously absorbed; and when, in the summer, the patient was able to begin to use his limb, the power of movement, which at the beginning was abolished by immobilization and inflammation, returned completely in the course of a few weeks. Since then, the only reminder the joint exhibits of the pyæmic synovitis is a somewhat stretched capsule. There was an extra-articular abscess on the anterior and outer sides of the ankle-joint, between the extensor tendons and the malleolus externus, and an effusion, at the same time, within the joint. When the abscess was emptied a portion of the disclosed capsule of the joint bulged into the cavity of the abscess, which had been cleaned out with antiseptics; a movement of the patient caused the capsule to rupture and the exudation, of whose character

I cannot report, gushed out; thereupon the joint was drained, rinsed out, and bound up. Further precautions, unfortunately, were neglected, so caries of the heel and outer border of the foot set in, which necessitated the resection, later, of the fifth metatarsal bone; and the flexors of the lower leg shortened without hindrance. The compressive bandage, which was firmly applied to and suffered to remain a good while on the thigh, had a share in producing the unfortunate results just noted. In July, when the foot was finally healed, it was completely fixed in the equinus position at the tibio-tarsal joint, and its outward form was entirely changed, through the presence of an extensive, hard periarticular œdema. Toward the end of October, Dr. Barbieri, who, unfortunately, was not called in till then, began to massage and gymnasticize the foot. Under his admirable treatment the mobility was so far restored that the patient soon was able, with the help of an orthopædic appliance, to bring the foot into a right-angled position. During the following two years massage, gymnastics, orthopædics, hot, local baths, etc., were employed at times; otherwise the foot was left to time and use. After the lapse of more than nine years, the outer form of the foot is tolerably normal; though considerable hyperplasia can be felt on both sides of the tendo-Achillis, and the anterior part of the capsule is thickened. After rest, the foot always takes the equinus position; in plantar flexion it lacks only a small angle of being completely flexed; but it cannot be bent actively to a right angle, which can be accomplished passively after a few steps have been taken. The tendo-Achillis is not fully tensed then, but the peronæi are strongly stretched. There is a tolerable amount of active movement of the joint; the walk, under ordinary circumstances, discloses a slight unevenness only to an attentive eye, but becomes difficult with changes of the weather, etc. Such a case, without energetic massage and gymnastics, would end, no doubt, in anchylosis.

Chronic Articular Rheumatism.—Chronic rheumatic joint inflammation, whether monarticular or polyarticular, in its very lightest forms, and when the constitutional conditions are favorable, may, *perhaps*, be brought to complete recovery through massage;—although mechanical treatment has as little power as any other to eradicate, or in the case of local massage, even to influence the ever effective predisposing causes of the disease. In well developed cases of this joint-affection, which, beyond doubt, is due to profound disorder in the organism, we ought not to promise patients a full release from their ailment. But massage yields better results, even in these cases, than does any other form of treatment; and often achieves essential improvement, since it can heighten functional power, delay the development of the process, and prevent its assuming its most severe forms (see, for instance, the interesting case of Gussenbauer's, cited below). In the most severe cases, such as are customarily called, *Arthritis chronica rheumatica ankylopoetica*, in which not only the soft parts but also the cartilages and even the bones have undergone serious changes, massage is obviously

of as little use as any other form of treatment, and ought not to be undertaken.

For the rest, we should not neglect other usual measures: woollen clothing, warmth-producing compresses, water-packs, douches, local hot water or mud-baths, etc.*

1. Baroness F. de X., from London, a rather corpulent lady, of about forty years, had had for some years a difficulty with her right knee, which gradually increased, so that the mobility became restricted and the walk painful, especially on standing up, and when the weather changed. In July, 1885, I examined the case for the first time. The right knee, on inspection, presented some changes, and the capsule felt a good deal thickened on the outer side, and somewhat so on the inner side; there was no increase of the synovial fluid within the joint. The patient, who positively objects to passive movements, can bend her knee to an angle of about 130°; when that is hastily done, the creaking of the joint, as is usual in cases of this kind, is heard. The patient does not complain as to the other joints, though in palpation analogous but insignificant alterations are felt in the left knee. The patient, who cannot remain in Carlsbad more than fifteen days, receives the promise that, through long sessions of massage, and a local hot mud-bath daily, she shall in that time be partially freed from her trouble, and that active mobility shall be increased to a right angle; as a reward for greater patience than was expected of her, she attained 80°. She was massaged by various people after that; and I next saw her again in July, 1887. The right knee-joint, on inspection, was found in much the same condition as two years previously, and was frequently quite unserviceable, but its mobility continued better than before massage; the left knee's changes were more evident and had already caused pain and functional disturbance; the left ankle-joint, on palpation, gave hints of on-coming disorder. After her daily mud-baths, she received massage, for twenty-eight sittings, and thereupon considered herself nearly recovered. If we both live, we are likely to meet again.

2. Mrs. T., 53 years old, from the United States of America, has been troubled by soreness and stiffness in her knees for many years. For the last four years she has had to use a cane in order to get about, and it is only very rarely and with great difficulty that she walks a block. This lady, who is very short, weighed 96.550 kilos on June 3, 1891. Her knees showed typical changes of the "dry" chronic rheumatic kind. The articular parts were palpably thickened; when the joints were moved passively—whereby almost the full extent of movement is attainable—a crackling noise was heard.

The patient was put upon a very restricted diet as regards carbo-hydrates and fat; took a fair amount of Carlsbad-water, and was required to walk a certain distance every day, which distance was increased as her knees improved. The special treatment of the knees consisted of vigorous massage-friction once a day, with warm fomentations every night, and hot mud-baths every second or third day.

The patient improved very considerably during eight weeks of treatment. During the latter part of her stay she walked about four English miles a day, though she still

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*How far the alkaline-saline mineral waters possess the qualities sometimes ascribed to them, as internal medicaments, I know not; but willingly confess that, in spite of my being a Carlsbad-specialist, I do not belong to those who look for perceptible effects upon chronic joint-troubles of a rheumatic nature, from the drinking of any kind of spring-water.

had to use a cane. Her weight has slowly decreased from 96.550 kilos, on June 3, to 85 kilos, on July 29, 1891.

3. Gussenbauer reports the following case, the account of which is somewhat condensed here: * A forty-year old lady was ill from her eighteenth year, when, without any assignable cause, the right elbow-joint slowly became swollen, without being painful except during movements. Next in order were the fingers of the right hand; and during the next twenty-two years the disease developed slowly, so that nearly all her joints were more or less invaded. The process remained stationary, according to the patient, only during two periods of pregnancy; at any rate the pains were much milder during those periods. She underwent a manifold medicamentous treatment, visited many bath-resorts, and resorted also to electro-therapy, but all in vain. During the eight years prior to Gussenbauer's undertaking the case, the patient could not walk, but spent the time in bed, upon a sofa, or in a rolling-chair, and thereby became much reduced, suffered from sleeplessness, constipation, a-rhythmic, small, weak, and scarcely perceptible pulse, and extreme debility. The urine was rich in urates, but showed no albumin.

Gussenbauer, himself, at first performed massage upon the affected joints for one and a half hours a day (those of the extremities, both sacro-iliac synchondroses, as well as some of the vertebral joints in the lumbar and thoracic regions), and also made general massage. This latter, which consisted largely of tapotement, was intended to exert an influence upon the interchange of material and the nutrition, especially in the atrophic muscles. Anchylosis was found in the right elbow-joint only; in all the remaining joints more or less mobility existed; and there were contractures in the joints of all the extremities. After fourteen days of treatment, during which gymnastics were also employed, there was marked improvement; at the end of a month the patient could walk with the help of a cane. The treatment was then continued for four months more by Dr. Schmid, an assistant of Gussenbauer's. The final result was that the patient was freed from her articular pains; swelling was much diminished in all the joints, and the mobility was restored nearly to its maximal amplitude, except in the anchylosed right elbow-joint. Muscular power was notably increased, and the patient could take long walks in her garden without weariness.

Arthritis Deformans and Malum Senile.—Arthritis deformans and senile changes in the joints † are, as we know, but little influenced by any form of treatment. We may well suppose that massage and gymnastics, if employed during the earliest stages of these diseases and continued for years, might be able to retard the process somewhat; at the same time there is little

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* The case here cited has sometimes been referred to, in the literature of the subject, as one of arthritis deformans. Gussenbauer, however, classes it under chronic articular rheumatism, with which, judging from the history of the case, it belongs; and states expressly that it does not belong with genuine arthritis deformans. (See p. 19 in "Erfahrungen über Massage," reprint from the Prager Medicin. Wochenschrift.)

† Many writers distinguish "malum senile" from arthritis deformans, chiefly because the characteristic outgrowths on the cartilage and osteoid new formations of the latter are lacking in the first form of the disease. Since we are here discussing only a particular form of treatment, I take the two forms together, which, on account of the atrophy and resorption of cartilage and bony substance which are common to both, stand very near to each other.

likelihood that this treatment can bring the process to a halt better than any other, or even, under the most favorable circumstances, lead to recovery. I have never treated one of these cases with massage myself; and in the few cases I have seen in which that kind of treatment was employed by others, no improvement could be discovered, at least by the patients, with the exception of an insignificant augmentation of functional ability.

Syphilitic Affections of Joints.—Syphilitic joint-affections have been treated by means of massage, whose significance in this connection, although not yet fully explained, can never be very great. In those cases in which syphilitic periostitis, ostitis, or osteomyelitis involve the joints, the great sensitiveness to pressure forbids all massage, which cannot be of any service in ulcerous processes, or in the joint-caries which sometimes arises from them, or in purulence which sometimes occurs in the affected joints of congenitally syphilitic children.

The rarer multiple subacute or acute serous synovitis which appears in the "secondary stage" of syphilis, generally with the roseola, soon disappears spontaneously or under the administration of anti-syphilitics, without the use of any other remedial means; and, so far as I know, joints thus affected have not yet been attacked by Messieurs the masseurs.

Ordinary specific joint-affections belong, as we know, to the "tertiary stage;" appear more or less chronic; are commonly monarticular with serous effusion, uneven thickening in the capsule and hypertrophic, stringy, or papilla-shaped fringes in the synovial membrane, defects in the cartilages, and oft-times genuine gummata in the bones of the articulation or in the capsule itself; usually with measurable tenderness under pressure; and likewise moderate functional disorders, and often with violent spontaneous pains, particularly at night. The last-named forms are the only ones which have been treated (by Hünerfauth) with massage without simultaneous anti-syphilitic therapy, but without the slightest success. Falkson treated such cases, which, as we all know, give a good prognosis when treated anti-syphilitically, with massage and the "*inunction-cure*," and obtained good results, as might be expected.

The sum of it all is, perhaps, this: resorption and recovery will sooner be effected in those cases in which an energetic anti-

syphilitic treatment is combined with massage than it could be without the latter.

Tuberculous Affections of Joints.—Tuberculous or "scrofulous" joint-inflammation ("tumor albus") has, for a long time now, at least in France, Germany, and the Scandinavian countries, been treated with massage by many physicians. More or less favorable histories of cases are forthcoming, but without contributing materially towards the removal of the uncertainty which must obtain, touching many essential factors of such a treatment, in our present knowledge of tuberculosis, which is incomplete in spite of recent progress.

What the effect of massage may be in the earlier stages of tuberculous joint-diseases is still to be considered wholly problematical. When, as is usually the case, the process begins in the bony parts of the joint, massage can scarcely affect its progress *in the same.* But, according to Schüller, the tuberculous process originates in a quarter of all the cases (and in about one-third of those of tuberculosis of the knee-joint) in the synovial membrane; and it is not extravagant to suppose that, in these cases, frictions may be able to cause the resorption of the young tuberculous foci, and hinder the further development of the joint-disease. On the other hand, we do not know how far, or under what circumstances, such a resorption is to be wished for, or whether it does not increase the danger of metastasis of tubercle into other places, or of promoting general tuberculosis. Finally, a question mark must always be placed after the diagnosis in those cases in whose earlier stages massage has led to a complete cure.

In cases of florid tuberculous joint-inflammation, where purulence already exists or is threatened, massage, in my opinion, is contraindicated, for the reasons which have been advanced already (p. 70). When surgery has done its part, when pus has a free outlet, and the purulent process is at an end, it is indeed probable that then effleurage over the appropriate vessels may hasten the restorative process. So, too, frictions, by breaking up the too luxuriant fungous flabby granulations, may call forth normal granulations, and thereby affect the healing process favorably.*

* I have reduced the above to writing from the oral communication of a highly esteemed colleague. I have, myself, never treated a tuberculous joint-affection during its inflammatory stage, with the exception of an incipient case, in which the diagnosis was uncertain. So soon as that became clear I immediately stopped giving massage.

The proper indications for the massage-treatment of tuberculous joint-diseases first arise when the process has terminated without destroying the joint. In these cases, which are not very numerous, massage and gymnastics in combination with general and other local treatment (*e. g.*, baths) may yield passable results, as appears from the following case, which is at the moment accessible to me:—

Miss B. R., born in 1870, showed scrofulous symptoms in her childhood, and developed in 1876 a typical left-sided scrofulous, *i. e.*, tuberculous inflammation of the knee-joint, with an enormous "white swelling," purulent processes, long open fistulæ, etc. The joint was treated surgically in the ordinary way; nearly three years passed before the healing was complete. Meanwhile a strong contracture showed itself, and the patient, being quite powerless to use the leg in walking, made use of crutches for a long time. The joint completely lost the power of motion; besides it was painful, and frequently the seat of violent spontaneous pains. During her tenth year the patient used massage, which was performed by a female gymnast, without the slightest success. Finally, in the winter of 1884–85, the patient entered upon a course of Dr. E. Fogman's admirable massage-treatment, which lasted nearly a year. The joint was subjected to effleurage and frictions. Slight forced extension-movements were made at every sitting, which, by the patient's choice, took place only twice a week at first, later three times weekly. Thereupon essential improvement set in, the pain and tenderness departed, the contracture diminished, and the patient was soon able to walk without help. Just before this work was sent to press, I examined this patient, who had walked at a quick pace from her home to mine, quite a distance; I found a slight contracture of the leg, and that an angle of about 25° was lacking from complete extension. The active mobility of the joint seemed at the moment to scarcely exceed 10°, but, according to the patient, it is frequently much greater. There are considerable changes about the joint; the internal condyle of the femur is considerably enlarged; the patella is sub-luxated outwards; there is a large scar on the internal condyle of the femur; another anteriorly, and one in the popliteal space at the under border of the capsule. The musculature is only somewhat atrophic; the greatest difference between the two calves is three centimeters, between the thighs eight centimeters. The leg is somewhat shorter than the right; the gait is halting, but very quick and enduring.

Arthritis Urica does not belong with those joint-affections in which massage can exercise any considerable curative effect. In far advanced cases, in which deposits of uric acid and urates are palpable, there is no prospect of our doing anything for the deposits; it is equally useless to think of massage, when open wounds exist, which might, in addition, do positive mischief through injury to the often sclerotized vessels. Still, it is not inconceivable, though hitherto it is entirely unproven, that massage may in some degree counteract the development of articular changes, when it is resorted to in the very earliest stages of such

affections. Finally, I have good reason to think that typical attacks may be essentially ameliorated through the use of effleurage. A Swedish physician who had suffered long with chiragra, informed me that a worthy colleague of ours, Dr. Fogman, who has already been mentioned in these pages, could prevent the complete development of his attacks by massaging his hands so soon as the first "warnings" made their appearance. Dr. Fogman explained to me that in six cases of podagra, by means of effleurage given very lightly at the outset but more vigorously later, he had been able to lessen the patients' pain to such a degree that, whereas formerly they had to go to bed during an attack, they were now able to stay up and even move about at such times with more or less ease. Dr. Fogman has never observed or expected any greater effect from massage in such cases than that just mentioned.

Articular Neuroses.—Joint-neuroses or neuralgias are still such indeterminate expressions, that it is needful for us to explain what meaning we attach to them before discussing the significance of massage in the therapy of the joint-affections which they connote.

Billroth,* whose experience in this as in various other departments entitles him to the highest rank among surgeons now in practice, divides the joint-diseases which are wont to be called joint-neuroses and which almost always concern the knee, and more rarely the ankle-joint, into the following four categories:—

1. Cases, in which pains arise in the joint after comparatively slight injuries, whose intensity bears no relation to the small residual alterations or thickening of the joint.

2. Cases in which, after the termination of spontaneous articular inflammation which leaves insignificant residues, pains declare themselves in the joint which prevent its use.

3. Cases in which the patients, without having had an injury or inflammation previously, experience such violent pains in walking that they cannot or will not walk.

4. Cases in which the patients as a result of partial psychical disturbances (hysteria, hypochondria) simulate pains, at first, and later are really so apprehensive of experiencing them that they will not move.

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* *Wiener med. Wochenschrift*, 1874, No. 45.

The first two of the categories, which the renowned Vienna surgeon has proposed, constitute, as every masseur knows, the great majority of the affections called joint-neuroses; but really are not neuroses at all. The residual exudates and infiltrates from traumatic or non-traumatic synovitis give rise to pains, by reason of the tension of the tissues and the pressure on the nerves; which, as is true of every other stimulus to sensation, are much more troublesome to excitable and nervous patients than to persons with more vigorous nervous systems. If the products of inflammation are accessible to frictions, then, as we know, they vanish under the influence of that manipulation, and with them vanish the pains also, and the whole of the so-called neurosis.

The third category represents the rare cases of genuine joint-neuroses or joint-neuralgias, which resemble other neuralgias, by reason of the absence of pathologico-anatomical changes, and often through the violent pains caused by slight mechanical irritation, through the presence of "*puncta dolorosa*" and the accompanying motor and vaso-motor disturbances. These cases occur in chlorotic, anæmic, or psychopathic persons, and it is a difficult matter, indeed, to distinguish them from cases that should be assigned to the fourth category, or to determine whether they are simulated or whether they result from more or less "involuntary" manifestations or from genuinely painful sensations. It is equally difficult to pronounce upon the worth of the various therapeutical measures, ranging from hypnotic "suggestion" to massage, of which trial is made, in such cases, and may or may not prove successful, for reasons of whose nature we are profoundly ignorant, and may, perhaps, always remain so. We are reminded here of the changeful and enigmatical hysterical symptoms which do not concern the joints. An hysterical patient, for years, may horrify those about her by severe epileptiform attacks, which yield permanently to a subcutaneous injection of distilled water, administered with proper solemnity. Another hysteric, who has been dumb for years, or, at the most, has only spoken in whispers, finds her laryngeal muscles and her vocal cords in good order as soon as she feels the electrode in contact with her skin, whether it chance to be connected with the battery or not; or she shrieks out her fancies with the utmost distinctness, in the excitable stage of chloroform-narcosis, etc.

In the few cases I have seen which belong to the forms under

consideration, I was puzzled whether to put them into the third or fourth category of Billroth; and a like uncertainty may well suggest itself to all, in an even higher degree, when knowledge of a case is confined to what may be gathered from a report of it. The reader may find it so, for example, in the somewhat condensed account given below of a case reported by Dr. A. Bum.* I have, myself, never massaged a joint that did not present palpable alterations.

Dr. Bum's report is as follows:—

Mathilde R., seventeen years old, the daughter of a policeman, was anæmic, very excitable, disinclined to all bodily and mental exertion, and had had an attack of eclampsia in her third year. One morning she declared that she could not get out of bed because of pain in her left knee. After a time she was received into a hospital, from which she was discharged as "improved" after a five weeks' stay. She walked home, a fifteen minutes' walk, and immediately took to her bed again. There she remained for several months. Pains, which she described as "furious," recurred almost daily, lasting several hours. They never occurred at night. She lay still, preferably on her back, since she feared to bring on an attack by a change of position.

Dr. Bum examined the patient on March 11, 1885, seven months after the pains began. A light touch on the knee-joint gave rise to a "fulminating" attack of pain. The joint, upon close examination, did not present the slightest objective symptom, or any difference from the joint which was sound (not even in respect to temperature); and an examination under chloroform, yielded no other result. During the anæsthesia energetic massage (effleurage) was given; and later, massage was given daily, *at which the patient, who demanded to be anæsthetized, became satisfied with a hint of chloroform† on the sponge, whereupon the pains ceased.* During this treatment, combined with tonics and baths, the patient had only two or three moderate attacks; at the end of a fortnight she tried to walk; and in six weeks she was positively free from her ailment.

Zabludowsky ("Archiv. für Klinische Chirurgie," 1884, Bd. XXI, p. 398), gives an example of knee-joint neurosis, in which the pains disappeared during massage-treatment, but quickly reappeared under psychical influences; but gives no more details about the case.

As the reader will see, certain doubts arise as to the nature of the case cited from Bum. For myself, I never knew a case that could be assigned with any probability to Category 3 that was cured by massage. Nevertheless, it is fully justifiable to try it in such cases. It should then consist of vigorous effleurage in order to bring about a lively circulation within the joint, as well as of tapotement over the joint and the nerve-trunks distributed to it, in order to start a "change of tune" in their activity. At any rate, it is right to seek by means of a harmless procedure (which is as hopeful as any other) to quiet pains that may be so agonizing, for example, after repeated amputations and the excision of nerves, as to lead to nothing less than—exarticulation of the hip-joint. ("Pitha and Billroth's Chirurgie," Bd. II, p. 681.)

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* "Die Massage in der Neuropathologie." Wiener Klinik, Jan., 1888.

† The trace of chloroform surely did not, in its capacity of an anæsthetic, abolish the pain.

CHAPTER XII.

DISEASES OF THE EYE.*

Since the beginning of the seventies, and especially in the last few years, massage has very rapidly invaded the province of the oculist, into which it was introduced by so powerful an advocate as Donders. Without doubt, however, the one who has done most to make a place for massage in ophthalmology is Pagenstecher.† Ophthalmologists and other physicians have

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* I take particular pleasure in acknowledging the use I have made of Dr. Kiär's essay "Om Mekanotherapiens Betydning i Oejenlaegevidenskapen" (Köpenhamn, 1885), *i. e.*, "On the significance of Mechanotherapy in Ophthalmology," Copenhagen, 1885, both for the information regarding massage in this field and for the summary of literature and history pertaining to it which the work affords. I consider Dr. Kiär's work to be one of pronounced value, since it bears the stamp of accuracy and of sober judgment. Nevertheless, the work may well be held to leave various questions for future investigation to settle, which the author considers to be completely solved. Furthermore, I differ in opinion from Dr. Kiär as to the oft debated meaning of massage. Since he points out that the word massage is derived from the verb which signifies to press; that in eye-massage pressure is the very thing to be avoided; and that massage, furthermore, consists of a series of closely related manipulations, only a single one of which is used in this case: Kiär concludes that "both from an etymological and the strictly scientific standpoint it is peculiarly and wholly unjustifiable to apply the term massage to such manipulations as are limited to light rubbings." This, as I think, is a very superficial and wholly mistaken way of viewing the matter. In the first place, as is clear to all, we cannot in framing definitions be governed by the original etymological significance of words. Furthermore, it is inconsistent to say that even in light frictions one must wholly abstain from making pressure, as Kiär himself recognizes on page 33, it is impossible to make frictions without any pressure at all, even when from obvious anatomical considerations it can only be slight or very moderate in amount. Moreover, there are many cases, not included under eye-massage, in which we employ a single manipulation, effleurage for instance, wherein even Kiär would not scruple for an instant to admit that we employ massage. Manipulation in massage of the eye answers the purpose both of effleurage and frictions, and, therefore, must be performed differently in different cases, although this difference, owing to the size of the massaging finger in proportion to that of the eye, is less striking than in the case of effleurage and frictions of the extremities. Dr. Kiär is, therefore, quite right when, contrary to his reasoning, he invariably makes use of the word massage as denoting this manipulation, and has no need to excuse himself, therefore, on the ground that it is easier to "wrestle" with the word massage than with the word mechano-therapy. Kiär is surely too conscientious a man to use an incorrect expression, even if it does strike him as easier to "wrestle" with.

† "There is nothing new under the sun," and there are many authentic (?) statements concerning the use of the eye-massage in antiquity. Moreover, it was made use of previously to Pagenstecher's time in various places, by specialists of our own day, in clinical practice, as for instance in Bohemia, according to Schenkl, and in Italy, according to Gradenigo. Swedish gymnasts have also made their contribution (Nikolaysen), which is not surprising in view of the great willingness of those gentlemen

investigated the matter in all seriousness, and, although in some respects there still exists uncertainty amongst them as to what we are justified in expecting of massage, there can be no doubt that it will be accorded a not inconsiderable place in their practice in the future.

The technique of massage of the eye is infinitely simple. No matter what part of the eye is to be massaged, the mechanical treatment, in the majority of cases, consists of frictions on or with the eyelids (see Fig. 6). From a technical standpoint, however, various not unimportant differences and opinions assert themselves. Pagenstecher, who unquestionably has a right to be heard on all such questions, in massage of the eyeball executes his manipulations in such a way that he "fixes" the upper or lower eyelid near its edge with the thumb or forefinger (which is equivalent to saying that he presses lightly against the globe) and makes a light rubbing with the same, always exerting a minimal amount of pressure. He makes a distinction here between radial and circular frictions, and considers the first named to be the more important. They are executed from the centre of the cornea in the direction of the equator of the globe. Whereas in circular massage of the eye the frictions are made from the corneo-scleral border. In radial massage one can work upon one sector only of the anterior part of the eyeball at a time;

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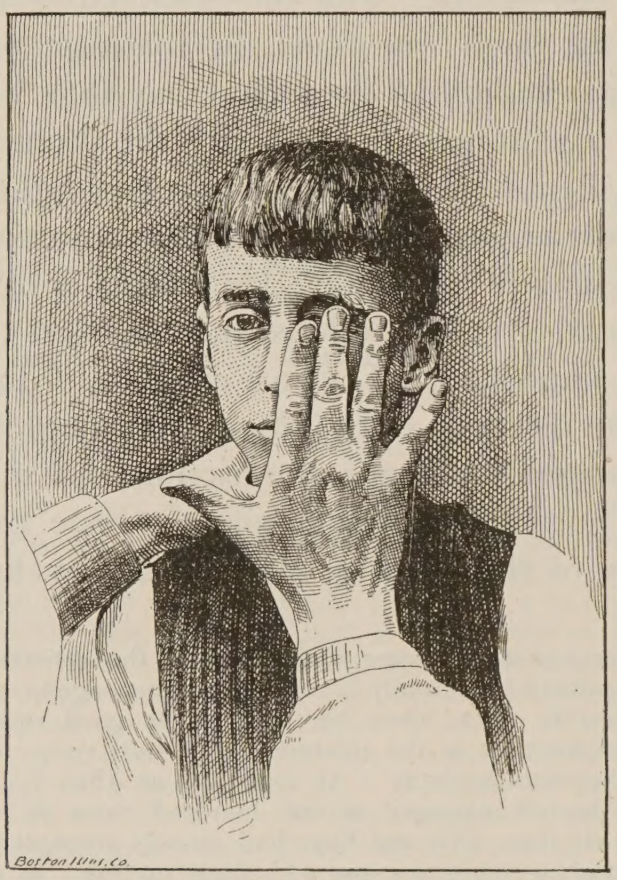
to lend a hand in every case of disease, and in view of the general existence of eye-diseases. After Donders had formally introduced eye-massage to ophthalmologists, at the London Congress in 1872, when he reported the good results which he had obtained from its employment in the treatment of corneal spots, published accounts of a similar nature began to multiply. As long ago as 1874 J. Heiberg, of Christiania, declared that he had massaged several hundred cases of corneal spots with good results. At that time Kiär and Faye had already attempted massage, though each had tried it in only a single case and with slight success. In 1878 Pagenstecher published his first communication, which aroused marked interest. In 1881 he published a complete account of his already abundant experience as to the therapeutic value of massage in many diseases of the eye. Since then the matter has received a vigorous impulse from Schenkl in Austria, Gradenigo in Italy, and Panas in France. Besides these a great number of ophthalmologists have made contributions of their own, and a list of most of them may give the reader an idea of the activity which has prevailed in this branch of ophthalmology in the last few years. The list is as follows: Abadie, Becker, Carré, Caudron, Chodin, Csapodi, Damalix, Dujardin, Dantziger, Friedmann, Förster, Gallenga, Hansen, Heisrath, Helfreich, Hirschberg, Hock, Jacobson, Julian, Junge, Just, Klein, Kroll, Kostomyris, Van der Laan, Landolt, Lapersonne, Mauthner, Michel, Mules, Nordman, Pemerle, Pedraglia, Phillipsen, Pfaltz, Priestley Smith, Rossander, Schenkl, Schmidt-Rimpler, Schnabel, Snell, Schröder, Stedman Bull, Thea, Uhthoff, De Wecker, Wicherchiewicz, Widmark. Taken as a whole massage has had a happy lot in ophthalmology, as ophthalmologists, in most cases, possess sound medical training, which renders their domain less open to the encroachments of ignorance. Nevertheless, we delude ourselves if we suppose that the usual mechano-therapeutic enthusiasm has not played occasional tricks in this domain also.

and, if it be necessary, in this way manipulate the four quarters of the globe in succession. When massaging the upper sector we should tell the patient to direct his gaze downward; thereupon, as we pass to the outer sector, the patient should look inward, etc. Only in cases of massage of the lower sector are the frictions made with the lower eyelid; in the other three cases they are made with the upper eyelid. The frictions are made rapidly, as has been said. Kiär says that he makes from one hundred and twenty to one hundred and fifty "turns" in a minute,

FIG. 6.



MASSAGE OF THE EYE.

i. e., he makes an equal number of frictions to and from the centre of the cornea in radial massage, and over the entire corneal border in the circular form of massage. I find that my own rate is somewhat quicker, and that I make about two hundred strokes in a minute.*

* In massage of the eyeball, I always find it most convenient to make use of the tip of the middle finger. I execute the movements necessary for this manipulation chiefly from the wrist, although the whole forearm participates somewhat therein. This must also, sometimes, be the method used by Pagenstecher, since pictures originating with him, that are used to illustrate radial eye-massage in Reibmayer's "Technik der Massage," represent the middle finger as performing the rubbings. It is best that every one should use the finger that is most convenient for him.

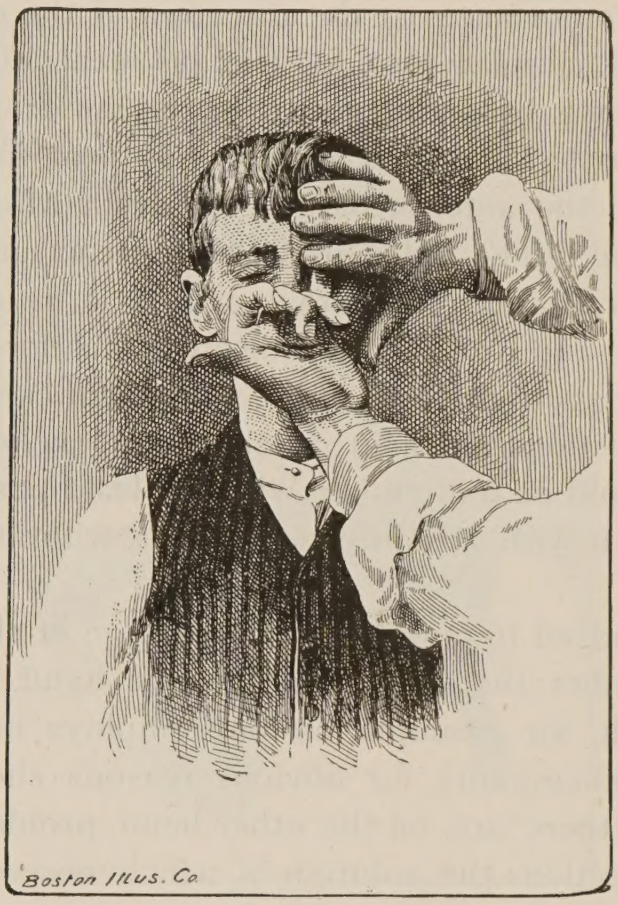
However, several additional and explanatory remarks may reasonably be made regarding the pressure and form of the frictions. It is, indeed, true that the radial frictions follow the course of the scleral and the epi-scleral vessels rather closely, and therefore promote the circulation in these vessels rather more than the circular manipulations. But the difference in this respect cannot be very great, since the finger-tip covers so large a part of the whole territory included in its excursions. For my part, I have, therefore, in agreement with other physicians, who have had a far greater experience in eye-massage, seldom attributed much importance to the direction of the manipulations: and, since the circular form of friction seems to me easier of execution, I have, by preference, used the same; while, in many cases (for example, in cases of pannus or corneal opacities), I have simply rubbed the anterior part of the eyeball from side to side with the eyelid. The radial frictions, however, meet somewhat better the special aim of effleurage, which is usually prescribed in such cases, and are chiefly indicated, therefore, in the comparatively few acute diseases of the eye which can be treated by massage. Frictions, then, in order not to excite too great an irritation, should be undertaken with the least-possible pressure, or, to express it with absolute correctness, without any pressure whatever.

In many, indeed in most, cases of massage of the eyeball, one should remember that while, on the one hand, a very strong pressure (such, for example, as one employs in friction of a hyperplastic knee-joint), for obvious reasons should never be made use of; there are, on the other hand, problems connected with these affections the solution of which necessarily demands a certain degree of pressure. We have to bring about resorption of infiltrations and exudations; to induce regressive changes in newly-formed and more or less organized tissues, etc.; and frequently have to do with changes of very long standing. In such cases we make no progress if we use only slight frictions; and, provided we give heed to all contraindications, especially if no irritation of the iris exists (see below), we shall not incur any danger by employing a moderate and not inconsiderable degree of pressure. To be sure, we do cause thereby, for the time being, a marked hyperæmia, which, however, does no harm but contributes rather towards promoting the process of

resorption. In massage of the globe of the eye with and through the eyelid, the latter is held firmly in position under the end of the finger, if one inserts the corner of a handkerchief between the two. By so doing, however, excoriations are more easily produced than they otherwise would be in the skin of the eyelid.

Massage of the eyelid can be performed in the same way as massage of the eyeball, namely, by rubbing the former against the latter. Where changes of such a nature were present

FIG. 7.



MASSAGE OF THE EYELID.

that I wished to employ a strong pressure, especially where the upper eyelid was concerned (for example, in cases of trachoma); I have been wont to execute the massage in the manner following: I insert the tip of the little finger (smeared with a salve of yellow precipitate of mercury or some other ointment) between the lid and the ball of the eye (see Fig. 7), with the back of the finger-nail turned toward the latter, and then knead the eyelid between my little finger and the forefinger of the other hand, in such a way that, while the frictions are performed by

means of the little finger within the conjunctival sac, the fore-finger, being applied externally, serves as a support. This method has the advantage of allowing the use of much stronger pressure than any other; and the massage, therefore, is plainly more efficacious. The patient bears this manipulation, which is by no means painless, fairly well, after he is a little accustomed to it. Kostomyris, in Constantinople, has applied massage directly to the conjunctival membrane of the upturned eyelid, making use of powdered boracic acid on the little finger, and thereby obtained very fine results—rather too fine, I think.

Eye-massage lasts usually, at any given point, for about two minutes (in order to apply radial massage to the four sectors of the entire eyeball, one then requires eight minutes). As a rule, one gives massage once a day. The more torpid the case the more necessary may it become to give massage twice a day, and the more necessary will it be to have the sessions longer and more energetic.

Eye-massage is peculiar in that it is usually directly combined with medicinal treatment, which consists in adding therapeutic agents to the massage-ointment. It is true that some physicians use only simple massage, while others use pure vaseline as an ointment in giving the massage. The majority, however, use yellow oxide of mercury ointment, varying in strength from 1:200 to 1:10. I have frequently made use of the last named proportion in torpid cases, especially in pannus, but usually employ a one or two per cent. ointment. The ointment must be very carefully prepared, vaseline being the best basis. Heisrath uses an ointment of iodide of potassium which, according to Kiär, acts as a strong irritant. Its composition is: Iodide of potassium, 1.0; Bicarbonate of soda, 0.5; Vaseline, 10.0. Where clear indications exist, we may introduce other materials, for instance, cocaine-vaseline or eserine-vaseline (1:40). I have already mentioned that one physician, in cases of trachoma, massages with boracic acid powder; more are accustomed, in cases of scrofulous ophthalmia, to massage with calomel. The ointment of yellow oxide of mercury or "yellow precipitate salve" is more frequently used than all the others put together. After the massage is finished, care should be taken not to leave too large lumps of the ointment within the sac of the conjunctival membrane.

As regards the physiological effects of eye-massage, not much needs to be added to what has been set forth in Chapter III of this book, and what has been later urged upon the attention of the reader (perhaps too frequently) here and there in different parts of the same. In addition to its oft-mentioned influence upon the circulation, resorption, etc. (as well as its tonic effect upon the orbicular muscle), eye-massage has also the effect of reducing * intra-ocular pressure, for the time being. Reibmayr states that, when one eye is massaged, a reflex dilation is to be observed in the pupil of the other eye during the first minute; that this dilation quickly gives place to a contraction; and at the end of the third minute the pupil of the eye that has been massaged is more strongly myotic than that of the non-massaged eye, even when both eyes have been closed during the massage and then opened simultaneously. The reader will frequently find it difficult to observe the last-named phenomenon.

The contraindications of eye-massage are the general ones alluded to on pages 68 to 73. In the Swedish and German editions of this book I have set forth iritis and irido-cyclitis as absolute contraindications against massage; being accustomed ever since my student days to consider the absence of irritation as of paramount importance in these diseases. I have recently learned that Dr. Boekmann, of St. Paul, Minnesota (in whose professional skill and sound judgment I have great confidence), is of another opinion, in so far as he considers that massage not only is not contraindicated in sero- or plastic irido-cyclitis, but that it is of great value in the latter stages of such cases. He says, "Massage only acts advantageously on the irido-cyclitis of the eye, as soon as it can in the least endure the manipulations, and one ought to be neither too sparing nor too lenient with the finger." Acknowledging my own utter lack of experience in this matter, I leave this question to my American readers for investigation. For my part I would certainly do as Dr. Boekmann does and reserve massage for the latter stages of the irido-cyclitic process, when the violence of the symptoms have abated.

Massage of the eye ought usually to be performed by a physician. Should it be left to other hands, it is generally best to

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* Kiär states that it may take from two to three hours for the fall in intra-ocular pressure, resulting from two minutes' massage, to become fully compensated.

intrust it to those of the patient himself. Still, I have occasionally taught laymen to perform this manipulation, chiefly in cases of children with spots on the cornea, where the massage must often be continued for several months, and would take too much of a physician's time.

Diseases of the Conjunctiva.

Conjunctivitis Catarrhalis Chronica.*—The conjunctiva is moderately reddened in lighter or more recent cases; often smooth and slightly swollen in severer or older cases; hypertrophically thickened and velvety. Sometimes small round red or pale yellow granules are seen in the marginal part (conjunctivitis follicularis). The amount of secretion varies; frequently it is utterly inconsiderable. The eyelids are stuck together on awakening; the eyes feel heavy; there are sensations of itching and of burning, or stinging pains, or of foreign bodies in the eye; and rainbow colors are seen around the flame of a candle through the mucus on the cornea. Lighter forms usually continue for decades without great changes occurring; the severer forms may be accompanied with blepharitis, eczema, *eversio puncti lacrymalis inferior*, ectropion, blepharo-phimosis, etc. It usually occurs in adults.

Kiär has treated this affection with good results by means of massage, which, judging from our present inconsiderable experience, promises to be of great value in connection with the usual astringent ointments, washes, hygienic rules, etc. So far as I know there are no other published cases besides those of Kiär, which, though few in number, are very instructive.

I bring forward two of Kiär's cases; one may be classed under chronic hyperæmia, and the other as a case of severe catarrh.

1. Fredericka B., 25 years old. For the past nine months the patient has had burning pains in the eyes with a somewhat increased flow of tears, but without any secretion of mucus being present. Long continued treatment with astringents was without result. She does some sewing by artificial light. The conjunctiva of the lids is somewhat swollen, as well as injected and œdematous, especially on the transition fold of the under eyelid; there are no abnormalities of refraction and no obstructions in the tear ducts. Massage with vaseline was given the patient. After very few sittings the subjective symptoms diminished; and after ten sittings they entirely disappeared.

2. Prof. S., M. D., suffered from the beginning of November, 1881, to the middle of January, 1882, with a very severe inflammatory affection of both eyes, which was treated with general antiphlogistic remedies; then with weak, later with stronger

* Since this book is partly intended for students who have not completed their ophthalmological studies, I give a short account of the principal symptoms of each form of disease noticed in this chapter. The so-called chronic hyperæmia, which is separately considered by some authors, but which is connected by innumerable intermediate forms with the more pronounced catarrhal affection, as well as the form in which the swelling of the follicle is more prominent, is here introduced under ordinary catarrh.

astringents, and finally with sulphate of copper and strong solution of blue vitriol, with slow and only partial improvement. Since then the catarrh remains unchanged, being attended with a muco-purulent secretion, with burning pains and a sensation of stiffness in the eyelids and a flowing of tears; which symptoms are marked by exacerbations after work or other injurious influences, in spite of continued intermittent treatment with weak astringents and periodical cauterization with copper sulphate. September 20, 1882, massage-treatment began with daily sittings of two minutes, a little vaseline being introduced into the conjunctival sac.

The objective symptoms then evident were: conjunctiva of the lids quite strongly injected and swollen, having a velvety surface without secretion or granulations; at the same time the conjunctiva of the eyeball was affected with a slight serous infiltration and hyperæmia; the borders of the eyelids were swollen and red; the lids were stiff and infiltrated; the secretion was scanty, muco-purulent, stringy. The right eye was the more affected. At the beginning of the massage-treatment the inflammatory symptoms increased; the cornea became more swollen and hyperæmic, and the secretion more copious, on account of which an ice bandage was laid upon the eye for an hour after each massage-sitting. Soon, however, the reaction became weaker, and after ten sittings there was marked improvement. The subjective symptoms had disappeared, the mucous membrane was considerably less swollen and infiltrated. The massage ceased after twenty-four sittings. The eyelids were then soft and normal, as was the mucous membrane; and there were no subjective symptoms left. In September, 1883, the patient again went to Dr. Kiär, as the eyes began again to be weak, possibly from over use, showing the same symptoms as before, although in a less marked degree. After fourteen sittings, both the subjective and objective symptoms disappeared in spite of the patient's uninterrupted literary labor by artificial light. Since then, at least up to 1885, the patient has been well.

This extremely interesting case, which, up to the present time, is the only instance of a severe catarrh of this kind that has been treated by massage, clearly indicates that massage should be employed in similar cases. Dr. Kiär expresses his conviction that the treatment in this case saved the patient from entering on the path which leads to marginal blepharitis, *eversio puncti palpebræ inferioris*, ectropion of the lower lid, etc., successively, which, indeed, is very possible, and can only be judged of by one who has seen the case. The therapeutical significance of this case, furthermore, derives strong support from a case of ectropion, which Kiär treated very successfully with massage. (See below.)

Spring Catarrh * **(Saemisch). Summer conjunctivitis (Schweigger). Conjunctivitis marginalis hypertrophica (Pagenstecher). Conjunctivitis æstivalis (Hansen-Grut). Hypertrophie perikératique (Desmarres).**—This affection, when fully developed presents a wholly characteristic picture in which the conjunctiva of the upper eyelid is covered with flat granulations, separated from each other by deep, narrow furrows. By reason of this it presents an appearance which has been compared to that of a street-pavement. On the conjunctiva of the eyeball there appear infiltrations either in the form of small, isolated, or rather-hard nodules, or of long, yellow protuberances. Over the whole conjunctiva there is a white scum, as of a thin coat of milk. The disease is peculiarly one of youth. It is characteristic

* Ophthalmologists make less and less use of the original name, spring catarrh, on the unquestionably substantial grounds: (1) because the affection has only a slightly pronounced catarrhal character; and (2) because it does not occur exclusively in the spring, although its symptoms exacerbate at that time.

of its course, which is a protracted one, that the subjective symptoms (itching, photophobia) disappear entirely in the cold season; while the objective symptoms decline somewhat, but by no means in the same degree, generally on account of the diminished hyperæmia. The disease lasts for many years, but after a while usually disappears entirely.

Pagenstecher, Klein, and Schenkl have treated this interesting form of conjunctivitis, with striking success, by means of massage. This is the more noteworthy, as heretofore the usual remedies used, such as ointments, cocaine (for the itching), surgical removal of the granulations, etc., have proven rather ineffectual. Pagenstecher massages with an ointment containing ten per cent. of the yellow oxide of mercury (commonly called yellow precipitate). By giving two sittings daily, he has been able to wholly subdue the most stubborn cases in a short time. Schenkl has had a similar experience. It is probable that the best method of treating changes of the conjunctiva of the upper eyelid consists in making massage directly upon the granulations by means of the little finger, which is introduced within the conjunctival sac. This, however, is a mere surmise unsupported by experience, inasmuch as no case of this rare affection has occurred in my own practice.

Klein reports as follows: A fifteen year old boy had a peculiar affection of both eyes, which was characterized a mixture of phlyctenular and granular conjunctivitis. It would be referred most naturally to the group of diseases for which Pagenstecher has proposed the name, marginal hypertrophic conjunctivitis. There was slight papillary swelling and a well-marked injection of the vessels of the conjunctiva of the lids and the eyeball. The cornea was completely clear, but along its border there was a rosary-like elevation consisting of small red nodules. There were no anomalies of secretion and no pains, but photophobia was well marked. The disease had continued for several years, and had been treated in every possible way, *i. e.*, with sulphate of copper, calomel, etc., without the least result. It always began in the warm season of the year; continued stubbornly throughout the whole summer; and about September slowly disappeared spontaneously: in winter the eyes were all right. Klein treated the trouble first by means of sulphate of copper and the insufflation of calomel, but without the least success. Since the patient was otherwise well, no general treatment was made use of. Recourse was now had to massage without any ointment, and striking improvement followed immediately. Meanwhile, on account of a journey, the patient withdrew from treatment before restitution was complete, which, according to Klein, would have been obtained in the course of a few weeks.

Conjunctivitis Granulosa seu Trachomatosa.—Trachoma is an infectious chronic conjunctivitis, which produces hypertrophy of the conjunctiva, together with the formation of velvety, papillary structures on the tarsal conjunctiva, and the characteristic round, gray elevations, termed trachoma-granules, particularly on the transition fold during its further development. The conjunctiva of the eyeball also undergoes change and becomes the seat of chronic hyperæmia and hypertrophy. The

cornea also becomes coated by a vascularized membrane (pannus) of greater or less thickness. Changes in the eyelids often lead to shrinkage by cicatrizations, inversion of the eyelashes (Trichiasis); inversion of the edge of the lid (Entropion), which may sometimes be substituted by eversion (Ectropion). The cornea sometimes becomes ulcerated and may give way before intra-ocular pressure (Keratectasia). The conjunctiva of both the lids and the eyeball may grow together from the conjunctival membrane (Symblepharon posterius). Sometimes the conjunctiva ceases to secrete and becomes dry (Xerosis). Total destruction of the function of the eye is not infrequently the final result of the process.

Trachoma rightly belongs among "massage-affections." But opinions as to its mechanical treatment are not yet well settled, and the notions as to what result should be attained are more divergent than usual. Still, it is clear that this uncertainty depends much more upon the physician than upon the condition of the eyes of the patient. The first to contribute to this branch of science was Dr. Heisrath, of Königsberg (1883), who occupies on the whole a mean position between extreme sanguineness and excessive skepticism. Still he sees the matter in what I fear is too favorable a light. He has employed massage in cases where the acute stages were already completed, and secondary transformation of the tissues had not yet begun. In such cases he used an ointment made of Iodide of potassium (Iodide of Potassium, 1.0; Bi-carbonate of Soda, 0.5; Vaseline, 10.0), and secured comparatively good results in four hundred cases. On the other hand, he does not recommend the method in more severe cases, where secondary transformations of the eyelids have already set in, or in which the cornea has become involved. A few months after Heisrath's results had been published, and without knowing about them, Dr. Kostomyris, of Constantinople, at a medical congress in Athens, made a report which was almost as astonishing as an Oriental saga. Dr. Kostomyris, making use of his little finger, applied massage directly to the conjunctiva of the upturned eyelids. Sometimes he used precipitate ointment, sometimes glycerine, and sometimes boracic acid powder, giving preference to the last named. In 1883 he had treated in this way over two hundred cases, among which were some that had already entered the stage of cicatrization; though it must be that they had not undergone any very great change in this direction. He had the inestimable good fortune *to cure them all*, and so rapidly that it was done almost in a jiffy! Most of the cases lasted from five to ten days and not a single one

more than forty! Dr. Kiär, of Copenhagen, accepts this apparently priceless gift, which the Greek physician has given to mankind, not without a certain degree of distrust, that is quite excusable. Dr. Kiär has himself massaged thirteen cases of trachoma in different stages of development; four according to the method of Heisrath; four according to that of Kostomyris; and, of the remaining cases, he treated some with vaseline and some with yellow precipitate ointment. Of those last mentioned he reached a very good result in one case; the remaining twelve continued unchanged in spite of long-continued massage.

It is impossible to mention the results of Kostomyris without the accompanying remark that among all the ruinous miracles that are daily reported in connection with massage they occupy the foremost place in respect to magnitude. However, in this respect one does not need to look far for an explanation. Dr. Kostomyris has made use of incorrect expressions in order to signalize his success, and has thereby injured his legitimate results. Even if the diagnosis in part of the cases be incorrect, or if here and there a follicular conjunctivitis or a conjunctivitis marginalis hypertrophica has crept in among his hundreds of cases,* nevertheless part of them must have been cases of trachoma. It is, then, immaterial whether the method of applying massage made use of by the Constantinople physician be good or bad; for my part I consider it pretty good. But whether one massages with the little or middle finger, whether one or another kind of salve or powder be used on the inside or outside of the eyelids, trachomata are not to be cured either in five or in ten days. It would be presumptuous, indeed, to declare that one can ordinarily perceive any considerable improvement in so short a time. At first when I had massaged a small number of trachomata in the ordinary way, making use of yellow precipitate ointment, and by rubbing the eyelids against the eyeball; I came to pretty much the same conclusion as Kiär, viz., that one has little to hope from massage in such cases. The patients experienced in a very short time some relief, which was commonly indicated by the "eyelids feeling lighter," on account of the diminished infiltration. Moreover, the massage beyond question contributes

* Kostomyris, up to the present time, has massaged 4164 patients, and is just as enthusiastic as ever. (Centralblatt, 1888, p. 172.)

to the resorption of pannus (see below); but, even in case of prolonged treatment, change in the conjunctiva of the lids is really scarcely perceptible, and the trachoma-granules seem completely unaffected by the treatment. Afterwards, when I tried the method of Kostomyris, by applying massage with boracic acid powder directly on the inverted eyelids, the results were somewhat more favorable. But it seems to me to be better, having introduced the tip of the little finger of one hand, which has first been dipped in water and then in boracic acid powder, within the conjunctival sac (with the nail toward the eyeball), to rub vigorously directly upon the conjunctiva while exerting counter pressure on the outside of the eyelid with the forefinger of the other hand. If one proceeds in this way by vigorous, but necessarily rather short, sessions of about three-quarters of a minute for each eyelid, one sees in the course of weeks and months the most intractable trachoma-granules become fainter and smaller—until at last they entirely disappear. In the same way papillary hypertrophy is diminished, scars become thin, the secretion becomes more normal, whether it were scanty or excessive, and the conjunctiva assumes a healthy aspect. Judging from an experience that is not very extended, to be sure, but one, I hope, that can be relied upon, in the course of which experience I have sometimes been enabled to compare the effects of different methods in the same case, I believe that we can attain in this manner very good results more satisfactorily than by any other means; that is, in all cases that are not too far advanced, and in which shrinkage is not a prominent feature. To counteract changes in the eyeball, especially in cases of pannus, one applies massage in the ordinary way with or through the lid, making use of yellow precipitate ointment. Even when trachomata are treated by massage in the manner above mentioned, which, to my thinking, is the most advantageous way; we should prepare the patient, in advanced cases, to wait for months before any essential or marked improvement shall appear. (See further on p. 187.)

1. A boy, Erik C., 13 years old, who had suffered from trachoma for several years (number uncertain), came under treatment on November 14, 1889. The conjunctiva of the upper eyelid, of both eyes, was for the most part covered with typical trachoma-granules set close to one another. There was marked secretion in both eyes. The eyelids were thickened, and the patient complained of a constant sensation of heavi-

ness in them. The conjunctiva of the eyeball and under-lids was unaffected. As this goes to press, March, 1890, the patient has had about one hundred sittings of massage, consisting of friction by means of the little finger (previously dipped in boracic acid powder) inserted within the conjunctival sac. The eyelids are less swollen or almost none at all; the patient is not troubled by any sensation of heaviness in them, and the secretion is no longer excessive. On everting the upper eyelid, one finds that considerable changes have taken place within three months, in that the trachoma-granules have become much flattened upon the middle of the lids. Where the frictions have acted most powerfully the granules have nearly disappeared, their former location being marked by mere spots which have a clear and very smooth surface. I think that in the course of the five or six weeks, during which I shall remain in Stockholm, I shall be able to remove at least the greater part of the still clearly-perceptible trachoma-granules on the fornix.

Conjunctivitis Phlyctenularis (scrofulosa, lymphatica).—On the conjunctiva of the eyeball, in the neighborhood of the limbus (sometimes upon the cornea itself, when it is called Keratitis phlyctenularis), one very often finds several round protuberances (efflorescences, phlyctenæ) as large as a hemp-seed (conjunctivitis pustulosa), of medium size (conjunctivitis phylctenularis vesiculosa), or smaller round elevations (conjunctivitis phlyctenularis miliaris). These phlyctenæ consist of white cells and (upon the conjunctiva) of lymph immediately under the epithelium. Their onset is marked by well-marked injection of the vessels, by photophobia, pain and cramp in the lids, and overflow of tears. The affection frequently passes, leaving no trace. It may give rise to ulcers, through the destruction of the phlyctenular granules. It occurs usually in scrofulous children. (See Keratitis phlyctenularis.)

Pagenstecher, Klein, Friedmann, Schenkl, Kiär, and many others have treated this very common affection by means of massage, and have thereby improved somewhat upon the ordinary method, which includes hygienic and anti-scrofulous internal remedies, calomel or yellow precipitate ointment. Kiär has compared the different forms of treatment. In one series of twenty-seven cases he employed massage alone; in another series he employed the precipitate ointment; and in twenty cases he made use of massage and precipitate ointment in combination. The results showed that massage by itself required the longest period of treatment, *i. e.*, eight to nine days; while precipitate ointment (1 : 40) without massage required six days for a cure; when massage and precipitate salve were used, the time of treatment required was five days.* The subjective

* Since these statistics treat of so extremely variable an affection as phlyctenular keratitis (without being entirely worthless on that account), they are still not sufficiently complete to allow us to draw any definite conclusions whatever. I ascribe importance to the general opinion of Kiär and other discreet and experienced ophthalmologists (Pagenstecher, for instance), that by adding massage to the treatment we get better results in these cases, than I should to any moderately full statistics of the history of cases.

symptoms under this form of treatment disappeared very soon —often after a single sitting.

Friedmann has had two cases and Kiär one, belonging to the vesicular form, presenting somewhat large phlyctenæ, in which massage was not well borne, since the injection of the vessels and pain was increased thereby. In all these forms of conjunctivitis only very slight pressure should be exerted in making the frictions, which are best executed as in Pagenstecher's radial massage. Such manipulations speedily cause the resorption of the lightly constructed phlyctenæ.

General treatment, by means of fresh air, sea-water baths, cod-liver oil, preparations of iodine and iron, is much more efficacious in scrofulous ophthalmia than is eye-massage, which affects the local condition for the time being only. (For a fuller statement in regard to the importance of using massage in scrofulous ophthalmia, see further under Keratitis phlyctenularis.)

According to Schenkl, sub-conjunctival ecchymoses may be quickly brought to resorption by means of massage.

Diseases of the Cornea.

Opacities.—Massage was first made use of in modern ophthalmology in cases of different sorts of cloudiness of the cornea, and it is in these very affections that its worth is at present best understood. Still, even here, we meet with a great variety of opinions in regard to its value. But on the whole, all who have made use of massage in this field, without allowing themselves to be discouraged by one or another negative result in severer cases, recognize that it contributes powerfully to the resorption of the corneal spots in various kinds of keratitis. The prognosis, although considerably improved through the experience gained with massage, follows, nevertheless, the old rule, viz., that the clearing up of the cornea will be easier or more probable, in proportion as the opacities are superficial, thin and fresh, and the younger the patient is. This is true in general. Not infrequently, however, cases occur which, though alike in all other respects, react very differently to treatment. Some writers claim more speedy results than others have obtained, and than any which, judging from my own quite limited experience, I should dare to hope for. I shall make no attempt to determine the reasons for this difference of opinion, which can

scarcely depend upon the technique, which is of a very simple nature. I venture to say that, as a general rule, even quite insignificant spots, nebulæ, nebeculæ, maculæ, or whatever one chooses to call them, commonly require several weeks, or even months, of treatment before they disappear. Deeply rooted, older, well-filled leukomata often remain as unchanged by massage as by other forms of treatment.

It seems to me a noteworthy fact that turbidity of the cornea, following parenchymatous keratitis, from hereditary and still effectual syphilis, may be favorably affected by massage, at least in certain cases. Of course, massage, in cases of this nature, should always be combined with an anti-syphilitic treatment (see below, Case 9).

Massage should be performed with yellow precipitate ointment, and with not too light frictions, whose direction, surely, is of the least possible importance. On the other hand, it is of the greatest importance that the anterior part of the eyeball be kneaded with the eyelid, and that the patient direct his gaze in such a way that the frictions shall be on the cornea.

It is seldom necessary to employ any other than general treatment in connection with massage in cases of corneal opacity.

Dantziger had recourse to abrasion in four cases, either of the epithelium alone or of a layer of the *tunica propria* in addition; about a week later he began with massage. I adduce the following cases as examples of the practice followed by various physicians:—

1. Case of Damalix. An eight year old boy with interstitial, central, strongly saturated, whitish opacity in both eyes, following diffuse parenchymatous keratitis, was subjected to twenty sittings: almost complete clearing of the cornea followed.

2. Julian's case. A girl, æt. 14 years, had diffuse leucoma of the right eye, following parenchymatous keratitis. Could distinguish fingers at a distance of 2 m. After 22 sittings, V = $\frac{20}{30}$.

3. Friedmann had a case in which a strongly saturated white leucoma disappeared completely at the end of 30 sittings.

4. Schenkl's case. Lamellar leucoma in left eye, following circumscribed parenchymatous keratitis, in a girl of nineteen, was completely cleared up after eight sittings, in which vaseline was used.

5. Kiär's case. A girl, one year old, had a well-marked whitish, porcelain-like, interstitial leucoma on the right eye. 36 sittings, with vaseline, yielded no improvement; 16 sittings, with precipitate ointment, also without improvement; none after 26 further sittings, in which iodide of potassium ointment were used; after 78 sittings in all, there was no improvement whatever.

6. Kiär's case. A girl of nine years, with rather whitish deep-lying opacities, about the size of a pin-head, on the cornea of the left eye, following circumscribed keratitis. After 11 massage sittings, precipitate ointment being used, there was evident improvement; after 17 sittings, there remained a scarcely perceptible spot.

7. Kiär's case. A girl of eight years, had a gray, rather full opacity, the size of a pin's head, upon the left cornea, following phlyctenular keratitis. The opacity was fully cleared up by eight massage-sittings, in which precipitate ointment was made use of.

8. Kiär's case. A youth of eighteen years had large, diffuse, gray, somewhat full, whitish leucomata, without vascularization, on both eyes, resulting from an acute inflammation fourteen or fifteen years before. After 50 massage-sittings, iodide of potassium ointment being used, no improvement, except an inconsiderable clearing, was discernible.

9. A case of my own. A girl, æt. 10 years, having chronic coryza. Scars at the angles of the mouth following chapped lips. Small, hard, and swollen lymphatic glands of the neck, low-bridged nose, Hutchinson's teeth, pronounced swelling on anterior border of the left tibia; with a clear history of hereditary syphilis, presents diffuse opacities of several years' standing in both eyes. Acuteness of vision of both eyes was not quite 0.1. The patient cannot read at all, but can count fingers at the distance of 1 m. After five weeks of massage with yellow precipitate ointment, the acuteness of vision of the left is scarcely 0.3; that of the right eye is almost 0.2. An elder relative of the patient was instructed as to applying massage. At the end of three weeks the patient showed herself again with the left eye unchanged, while the right showed well-marked irritation and the beginning of a new parenchymatous keratitis. The patient was now received into a hospital and received, at appropriate intervals, thirty inunctions of mercurial ointment, two grammes. When this treatment is finished, massage will be resumed.

10. A case of my own. A woman of 22 years, who has had, at times for ten years, quite deep opacities following diffuse parenchymatous keratitis; is unable to distinguish printed letters; can count fingers at a little distance. After seven weeks' treatment V = 0.1 in both eyes. On the left eye, in addition to the plainly diminished diffuse spots, four small, well-filled leucomata are found, which appear to have been unaffected by the massage. However, I think it very likely they are due to metal salts from a lead-water poultice, though the patient can give no information regarding one. The patient must now give herself massage.

11. A case of my own. G. J., a girl of 14, whose acuteness of vision was already below the normal, was attacked at midsummer, 1889, by parenchymatous keratitis. December 7, the patient, who had meanwhile been treated with atropin, calomel, etc., presented somewhat superficial diffuse parenchymatous opacities over both pupils, and was subjected to massage. Her acuteness of vision is 0.1 for the right eye and 0.2 for the left. February 14, 1890, V. of the left eye is nearly 0.6 and there is no trace of opacity to be seen; in the right eye the opacity has diminished and V = 0.4.

Pannus.—As is well known, this term, pannus, is used to designate a membrane, rich in cells and vessels, which occasionally occurs in trachoma and phlyctenular conjunctivitis, and finally develops into organized connective tissue between the corneal epithelium and the elastic membrane. Following the recommendation of Pagenstecher, Damalix, Julian, Kiär, Klein, Friedmann, Schenkl and others, pannus is now treated by means of massage, whether it be of trachomatous or scrofulous origin. Massage, of course, in this case, is efficacious in proportion to the age and de-

gree of organization of the pannus and the amount of its encroachment upon the normal tissues of the cornea. Massage now enters into competition, though never simultaneously, both with the old method of producing blennorrhea, by inoculation, and with the new method of causing a Jequirity-ophthalmia, and has the advantage over all others that it is without danger, as both the old and the new methods referred to may prove rebellious and cause perforation, panophthalmitis, etc. At the same time it has the disadvantage of being considerably slower, and often does not yield satisfactory results until after months of work

Our object here is to promote regressive transformation of the numerous cells as well as of the young blood-vessels and of the newly more or less organized tissues. As a strong hyperæmia* is of advantage in promoting resorption, massage should be made as energetically as possible, and a strong precipitate ointment may well be used. I have used one having the strength of 1 : 12.

In addition to massage, cauterization with copper sulphate, excisions, or the employment of the Paquelin-cautery, may be applied to the vessels of the pannus. I bring forward the following cases of trachomatous and phlyctenular pannus:—

1. Kiär's case. A woman of twenty-seven years, who was scrofulous, had from her youth suffered from periodical phlyctenular affections of the eye. Latterly she was subjected to the atropin and precipitate salve treatment without thereby preventing the development of pannus of both eyes. For about a year, acuteness of vision has been reduced to the mere perception of light. Both the corneæ are covered by a vascular, thick, diffuse opacity, in which scattered, superficial, whitish, fully-saturated infiltrations of the size of a pin-head are to be seen. A new eruption began a week ago. Well-marked pericorneal injection and acute subjective symptoms set in at the same time. The left eye of the patient was massaged with vaseline, and the right eye with precipitate salve. The subjective symptoms disappeared from the right eye after the first sitting. In the left eye they disappeared at the end of three sittings. At the end of six sittings the infiltrations were seen to be partially resorbed, and the acute inflammation of both eyes had stopped. The right improved somewhat more rapidly than the left during the whole time of treatment. After twenty-seven sittings the right cornea was almost completely clear and transparent, and the patient read with ease ordinary print with this eye. The left cornea is still slightly opaque, but without thick and vascularized spots; $V = \frac{20}{70}$.

2. M. A., a servant girl twenty-eight years old, has suffered from trachoma for seven years. Because of the trachoma and the resulting pannus she repaired for treatment, October 2, 1889, to Dr. Erik Nordenson, who daily touched the conjunctiva of the lids with copper-sulphate. The patient read at that time with the left eye, Jäger's

* It is best at the very outset to call the patient's attention to the necessity and advantage of maintaining a condition of irritation, especially during the early stage of the treatment.

trial test No. 3; while with the right eye she could not read finer type than No. 9 of the types referred to. Meanwhile, Nordenson and I having decided to make a comparative experiment with massage and the method of cauterization, in order to ascertain the action of both methods on pannus, used this case for the purpose. Treatment began October 29; after which time the left eye was treated solely by the application of copper-sulphate, and the right eye solely with massage. The condition was as follows when treatment began: on the mucous membrane of the eyelids scars are plainly perceptible, and in the fornix a great number of trachoma-granules; the lower eyelids present similar, although less extensive, changes; the entire conjunctiva secretes copiously; the lids are swollen and thick, and feel heavy; the cornea presents a clearly perceptible pannus, which leaves only the lower third free, and numerous small vessels running in a longitudinal direction. The acuteness of vision, under repeated examinations, did not rise to 0.1, but was not much below that. The left eye presented the same transformation to a less degree; but the pannus was thinner, far less developed, and richer in vessels than the right eye. The acuteness of vision was fully 0.2.*

The right eye was now massaged for ten days with vaseline, one sitting with quite energetic frictions being given for one and a half minutes daily. November 9 the acuteness of vision in the right eye had increased to fully 0.1. Jäger's test chart No. 5 could be read and some words of No. 4; during the same time the cauterized eye had V = 0.2, and could read Jäger's No. 2. That quite a rapid increase of acuteness of vision had been obtained by vaseline was satisfactorily determined both by Nordenson and myself; precipitate ointment, having a strength of 1 : 12, was then substituted for vaseline. On January 7 the application of cautery to the left eye and the massage of the right eye ceased. Both eyes then presented a more normal condition (upon each the trachoma granules were scarcely changed), with moderate secretion, lessened swelling, and eyelids less infiltrated. The pannus on the right eye, which was pronounced and evident at the beginning of the treatment, was now scarcely to be discovered on close search, although minute longitudinal vessels were still visible. The pannus on the left eye, which was from the beginning quite thin, is likewise, although to a less degree, changed. The acuteness of vision in the right eye is 0.2, which easily reads Jäger's test No. 3, as well as some words from No. 2. In the left eye the acuteness of vision is somewhat above 0.2; it easily reads Jäger's test No. 2, as well as words in No. 1.

When we take these facts into account, and are likewise mindful of the not unimportant circumstance that (in consequence of one of my acute attacks of illness) the patient received eleven fewer sittings from me than from Nordenson, it will readily be seen that massage, so far as the removal of pannus and the increase of acuteness of vision are concerned, has shown itself more efficacious than the old method of applying copper-sulphate to the lids, the right eye having made far greater and quicker improvement than the left.

Very recently, moreover, certain acute affections of the cornea have been treated by means of massage, with partial success. These forms are diffuse parenchymatous keratitis, phlyctenular

* I regret to say that I did not use Jäger's different tests in this case, because I thought that Nordenson had done so that very morning. When Nordenson applied the test, at the beginning of the month, however, the patient, as has been mentioned, read No. 3 with the left eye, and, for the first time, read No. 9 with the right.

keratitis, and traumatic keratitis. In all these forms massage, without question, must be performed with light pressure, and weak citrine ointment.

Keratitis diffusa parenchymatosa has been treated with massage by several physicians, viz. Carré, Friedmann, Klein, and Schenkl. Kiär's case is remarkable by reason of its great success,—in this respect it is somewhat isolated. Schenkl states that massage did neither harm nor good in his case. In Stockholm the ophthalmologists have had similar experience.

Klein's case. A very scrofulous girl, nine years old, was treated by Klein, for six weeks, for a diffuse parenchymatous right-sided keratitis which was strongly marked both as to its subjective and objective symptoms. By the use of anti-scrofulous remedies, local fomentations and the exhibition of atropin the inflammatory symptoms were gradually reduced, and the cornea began to clear up;—then the left eye began to be attacked by the same affection. When this left eye, after two or three days' treatment after the usual fashion, grew worse instead of better, Klein, being encouraged to do so by Prof. Mauthner, began to massage the strongly-affected eye, with the astonishing result that the eye was restored after three applications. Then massage was applied to the right eye, in which the acute stages of the affection had been completed. The treatment yielded a like surprising result, in that the opacity of the cornea vanished in the course of a few days.

Keratitis phlyctenularis acuta has for a long time been treated by means of massage by various German and French physicians, for instance, by De Wecker and by Thea. Kiär has a small but accurate list of cases numbering seventeen. Massage was used without any massage-salve in seven cases, and with precipitate-salve in ten cases (1 : 40). According to Kiär the best method in such cases is to employ the yellow precipitate ointment, as subjective symptoms disappear after a very few sittings; and the phlyctenæ likewise, in a very short time, are brought to resorption. Kiär thinks that he has discovered that this form of treatment prevents ulcerations and frustrates genuine opacity of the cornea. It would appear, therefore, that massage with precipitate-salve constitutes an improvement on the ordinary, though very good form of treatment in which powdered calomel is used. A few physicians not only employ such powder but also massage the eye. General treatment should, of course, never be neglected.

When symptoms of irritation, such as injection, photophobia, excessive flow of tears, are very severe, massage is not readily borne. On this account, I think it best to let several days pass

in such cases, as Schmidt-Rimpler advises, before one begins massage. Meanwhile one should make repeated applications of lead-water bandages, and dilate the pupil with atropin.

I adduce one of Kiär's cases here. A boy, of 9 years, extremely scrofulous, has suffered for a year with that disease; and has now, for five days, had phlyctenular keratitis of the left eye, with an irregular shaped ring of fifteen or sixteen infiltrations immediately within the corneal border. The whole cornea is covered by a veil-like opacity; there is a marked pericorneal injection, considerable chemosis and blepharospasm, which necessitates the use of an elevator for opening the lids. After three massage-sittings, precipitate-salve being used, the subjective symptoms disappeared; the infiltration was diminished; and a thick, fine network of vessels shooting in from the periphery along the whole border of the cornea appeared. After ten sittings all symptoms of inflammation had vanished, and all infiltration was absorbed, with the exception of some granular spots here and there and a slightly vascular peripheral zone. After six more sittings the cornea was entirely clear and transparent.

Keratitis in cicatrice has been treated with massage in three cases by Schenkl.

1. A woman forty years old had keratitis in an old vascularized scar. She was treated eight times with eserine-vaseline (1 : 40). The keratitis was completely cured.

2. A youth of fifteen years had a fresh keratitis adhering to an old leucoma. Complete restitution followed six sittings of massage with eserine-vaseline.

3. A boy of 9 years has fresh keratitis on old leucomata in both eyes. Received six applications of massage without any salve, and complete restitution followed.

Keratitis superficialis traumatica has been treated in six instances with very light massage and vaseline, by Kiär, with good results, in that the pain, photophobia, etc., yielded very quickly, and the whole process of repair occupied from two to three days.

A case of Kiär's. A woman of 32 years had received, a few hours previous, an injury from the finger of a child, in her left eye, which was followed by severe pain, photophobia, and flow of tears. On the cornea appears a rather broad, gutter-like, wholly superficial abrasion of epithelium, which looks as if it had been made by a small chisel, and reaches from near the periphery almost to the centre. There is a well-marked pericorneal injection. After one massage sitting, with vaseline, the pain, photophobia, and flow of tears were much diminished, and these troubles vanished completely in the course of the day. After the second sitting the pericorneal injection disappeared, and before the third sitting, on the third day, no trace of the wound could be found.

Ulcus serpens corneæ is treated with massage by Dr. E. Boekmann, of St. Paul, Minn., U. S. A. When he has a case of incipient ulcer of the cornea, Dr. B. searches for dacryocystitis;

if it be present he opens the duct and washes out the sac with some antiseptic solution. In case that there is blepharospasm, he makes use of the scissors on the external canthus. He then uses warm antiseptic fomentations, applies leeches, and gives massage twice a day with 1 p. c. eserine-vaseline.

He uses atropin only, when he suspects iritis and synechiæ, or when the inflammatory process is on the wane. This treatment is very often successful; still it must give way to keratotomy (with atropin or eserin) or to the actual cautery, now and then.

Diseases of the Sclerotic Coat.

Episcleritis, or the superficial form of scleritis, is a hearth-shaped inflammation (often due to a "rheumatic" cause), with infiltration and sero-fibrinous exudation in the outer layer of the sclerotic and in the upper layer of the conjunctiva. It is frequently situated anywhere between the cornea and the equator of the eyeball; it may be solitary; is sometimes as large as a bean; is violet in color, hard, and frequently proves extremely sensitive. They are frequently accompanied by violent ciliary pains and by immovable granules, on the conjunctiva, which disappear after a month or so, leaving a gray, scar-like mark. They readily return within the region mentioned above, but do not threaten the functions of the eye.

This rather uncommon affection, by reason of its pathologico-anatomical nature, invites massage-treatment, and is also one of the forms of disease which Pagenstecher first subjected to such treatment. This he did with brilliant results, which is the more worthy of notice as other therapeutic measures, such as the use of iodide of potassium, salicylate of sodium, excision, scarification, scraping, etc., proved highly unsatisfactory. His experience has since been confirmed by various German, French, and other physicians.

Pagenstecher has also employed massage in the deeper form of scleritis (conjoined with episcleritis through transitional forms of that affection), most frequently in the cases of tuberculous, scrofulous, or syphilitic persons. This form of scleritis, as we know, does not usually present distinct, sharply-circumscribed granular protuberances, but rather large and only slightly-elevated, violet-colored swellings. It is, moreover, far more dangerous than the preceding form, in that it diminishes, to a greater or less extent, the resistant power of the sclerotic against intra-ocular pressure, so that ectasis, or genuine staphyloma (the so-called ciliary staphyloma) may arise, or so that the entire anterior portion of the eyeball, and the sagittal diameter of the eye with it, becomes

elongated. Besides which, it may be accompanied by complications in the cornea, iris, and uvea, so that corneal opacities, synechiæ, occlusion of the pupil, turbidity of the lens and vitreous body, etc., finally destroy the function of the eye.

The newer handbooks of ophthalmology now include massage as a means of treatment in episcleritis and scleritis. It is also certain that it shortens their course to a considerable degree in their milder forms; what improvement it makes in the prognosis of the more severe forms cannot yet be stated with certainty.

Meantime one should carefully consider the nature of each individual case and not decide on *à priori* grounds to use massage under all circumstances, even when no general contraindications exist. Two colleagues of mine in Stockholm, Dr. Nordenson and Dr. Widmark, have made use of massage both in episcleritis and scleritis. They inform me, independently of each other, that they have, in some cases at least, obtained surprisingly favorable results through its use in connection with 2 p. c. precipitate ointment; but that, in some otherwise uncomplicated cases, they have seen the inflammatory symptoms measurably increased and were obliged to stop all mechanical measures.

Here, as elsewhere, under all circumstances, it is a *sine qua non* for massage that no iritis be present. One massages with yellow precipitate ointment. In many cases the extreme sensitiveness to pressure forces us, especially in the beginning, to make short and light applications.* Furthermore, it may be laid down as a general rule that radial massage should be employed in those cases in which only one sector of the eyeball is to be massaged.

Data concerning the effect of massage in scleritis have been collected in many instances, doubtless; still, so far as I know, in addition to Pagenstecher, only Kiär, Klein, Pedraglia, and Schenkl, have published their observations. I adduce one case belonging to each of the last-named four observers.

1. Pedraglia's case. A bookbinder, 20 years old, had a marked episcleral redness without trace of infiltration, on the whole outer half of the sclera of the left eye. The same arose without any apparent cause. The acuteness of vision was unchanged, but there was an uncomfortable feeling of tension in the eyeball. After four massage-sittings, made on successive days, without employing any ointment, only a slight redness remained; after six sittings the patient was well.

2. Klein's case. An accountant, 36 years old, presented himself with an affection of fourteen days' standing, the cause unknown, on both eyes. Between the corneal

* Schmidt-Rimpler advises the use of cocain-ointment where there are large infiltrations (Lehrbuch der Augenheilkunde, p. 50).

border and the outer angle of the eyelid a considerable circumscribed focus of inflammation, with slight chemotic swelling, was evident. There was a troublesome feeling of tension in the eyes; but no complications of any kind were discernible. After eight days of treatment with the ordinary medicaments, but without any trace of improvement, one eye was treated with pure massage by way of experiment, and noteworthy improvement resulted from the first sitting. On the next day the other eye was massaged, with similar result. After five and six sittings of massage respectively, applied alternately to both eyes, complete healing resulted.

3. Schenkl's case. A domestic, aged 52 years (who had suffered from the same affection, lasting many weeks, a year before), six days before she came under observation became the subject of a circumscribed episcleritic inflammation on the outer side

Observer.	Sex.	Age.	Disease.	Seat of Disease.	Number of Sittings Before Cure.
Pedraglia, .	Male.	20 years.	Acute episcleritis without formation of nodules.	Left eye, outside.	6
"	"	21 "	"	" "	4
Klein, . . .	"	36 "	"	Left eye, "	5
				Right eye, "	6
Schenkl, . .	Female.	52 "	"	Right eye, "	4
Pagenstecher,	?	?	Acute episcleritis with formation of nodules.	?	10
Kiär, . . .	Male.	12 "	"	Left eye, "	12
" . . .	"	29 "	"	Right eye, "	7
" . . .	Female.	30 "	"	" inside.	21 (incomplete cure).
" . . .	"	30 "	"		
" . . .	Male.	26 "	"	" "	14
				" "	22
" . . .	Female.	40 "	"	Left eye, above and outside.	29

of the right eye. On applying for treatment this had not disappeared. There was a feeling of tension but no complications. Immediately after the first sitting the redness and injection were notably diminished, and after four sittings the recovery was complete.

4. Kiär's case. A gardener, 26 years old, who had scrofula as a child, and had suffered since his twelfth year from episcleritis at intervals of one or two years. About a week ago, stinging pains, that radiated over the orbital region, with periorbital expansion set in in the right eye. On the inner border of the cornea, a well defined, violet-colored episcleritic protuberance, as large as a pea, and surrounded by slight hyperamia, is now observable.

There is no iritis. Here and there, upon the cornea, one sees round, slaty-gray colored, slightly expanded spots (the signs of former episcleritis) and corresponding to them wedge-shaped, cloudy spots are seen in the cornea. On the left side, similar

degenerative changes, both of the sclera and of the cornea, are to be found. Acuteness of vision of both eyes is less than $\frac{20}{70}$, and is unimproved by use of glasses. The ophthalmoscope reveals nothing abnormal. There is considerable local sensibility at the foci of inflammation, and severe racking pains in the eye. The tension is not increased. After four massage-sittings, in which vaseline was used, the painfulness, which was at first greatly augmented by the massage, completely disappeared. After thirteen sittings the infiltration was reduced to an inconsiderable flattened protuberance. After twenty-two sittings the eye was normal.

Kiär furnishes a very interesting table (see preceding page) of published cases of scleritis treated by means of massage. Six cases are his own and five cases belong to others.

Diseases of the Eyelids.*

Ectropion.—Ectropion is characterized by an abnormal position of the eyelid, usually of the lower, whose mucous membrane does not come into contact with the globe of the eye throughout its whole extent, but is turned out from it. In the lighter cases it is so turned outward that there is a slight interval between the globe and the inner edge of the eyelid; while, in the most severe cases, the conjunctival membrane is visible even as far as the transitional fold. Ectropion occurs in scars of the skin, in catarrhal and trachomatous conjunctivitis, in ulcerated blepharitis, in anomalies of the tear-ducts, as well as in senile tissue-changes.

Kiär has treated some cases of this sort quite successfully by means of massage. He makes, in this connection, a great and justifiable prognostic difference between those cases in which the ectropion is due to well-developed cicatricial tissue of whatever

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* *Blepharitis ciliaris* is an inflammation of the edges of the lids, which are hyperæmic and swollen. The skin between the cilia is covered with little scales (Blepharitis squamosa), small abscesses form in the hair follicles and sebaceous glands which give rise to ulcers (Blepharitis ulcerosa). The edge of the lid is often greatly thickened (Tylosis). Chronic conjunctivitis is combined with blepharitis: the ulcerated form occasions loss of cilia (Madarosis), or gives an abnormal direction to the same (Trichiasis); on account of their increased weight, the lids are in the hypertrophied form easily drawn downward (Ptosis); through retraction, due to cicatrices, the eyelids, especially the under-lids, become turned outward (Ectropion).

Kiär places blepharitis among "massage-diseases." As we know, the modern treatment of blepharitis (aside from the usual means, such as remedies for the frequently scrofulous or anæmic primary affection, as well as epilation of the cilia) consists of inunctions by means of a bit of linen and a weak yellow or white mercurial ointment. The procedure essentially resembles that which usually takes place in eye-massage, which, as has been mentioned above, usually consists of a mixture of mechanical and medicinal treatment. I dare say, nevertheless, that the great majority of physicians hold that in these cases the rubbing in reality serves only as a means for applying the ointment, whose office it is to remove the crusts and scales and to bring the metallic salt into contact with the surface of the ulceration. Through Kiär's own investigations, it has been shown that the ointment plays the principal therapeutic part, in that the treatment proves infinitely more efficacious if the mercurial ointment is made use of than if, in entirely similar cases, the rubbing is performed with relatively indifferent vaseline. Since, however, the rubbing possesses, beyond question, an influence of some sort, according to the way the frictions are performed, we may, if we will, with some right, attribute that influence to the massage. Its principal purpose, which is best attained when it is made with considerable energy, however, is to bring the ointment to bear at the right point—which, in short, may be taken as the substance of this long note.

origin and between other cases. Cicatricial ectropion, as is very obvious, has a much worse prognosis than the non-cicatricial. Kiär has achieved complete restitution in cases resulting from blepharitis, chronic conjunctivitis, and eczema. In one case of senile changes, slight improvement only was obtained in one eyelid, though both were ectropic. In a few cases of cicatricial ectropion, Kiär could see no improvement after long-continued treatment.

Massage is made, with the aid of vaseline, in long-continued sittings of from five to ten minutes, whenever the primary affection does not call for the use of yellow mercurial ointment.

I quote one of Kiär's non-cicatricial cases, as well as one of the cicatricial cases, in which the best result was obtained:—

1. Hans B., 53 years old, gives thirty years as the age of his eye-trouble, which dates from a conjunctivitis that he had as a soldier in active service. The patient states that there has been no change in his condition for the last twenty-five years. The lower lid of the right eye is completely ectropic, so that the cutaneous part of the lid lies against the cheek, while the entire mucous membrane, being thrown forward, presents the appearance of a thick, red, carneous tumor. Along the edge of the eyelid are sores, covered with dirt and dried secretion. There are no cicatrices. When the patient attempts to shut the eye, the cornea is rolled up under the upper eyelid, while for the space of a half a centimeter the lower part of the globe remains uncovered. The lower half of the cornea is covered by a light, pannus-like membrane. The left lower eyelid presents a similar but less pronounced ectropic condition. About two-thirds of the conjunctiva, which is less swollen than in the other eye and has no ulcerations, is thrown forward. When he attempts to wink, the under lid almost touches the upper. The patient is much troubled by an excessive flow of tears and a smarting, burning pain. He has often been treated by means of remedies dropped into the eye, etc., but without result. After six sittings, in which, vaseline being used, massage was applied directly to the ectropic mucous membrane, which bled easily, marked improvement showed itself, in that the conjunctiva was less swollen and the eyelid showed a tendency to resume its normal position, and the patient was much less uncomfortable than he had been for a long time. After nineteen sittings, the conjunctival membrane of the left eye was no longer visible, though there remained an obvious thickening at the edge of the lid, which prevented the inner border from coming into close apposition with the globe. The right lower eyelid was also strikingly improved and could be apposed closely to the upper. After seventy-five sittings the left ectropion was all gone, the conjunctiva being somewhat injected, but no longer swollen. The right eye then presented scarcely any genuine ectropion, the ulcerations were healed, and the cornea cleared. The subjective symptoms and the flow of tears had ceased. Along the edge of the lid the conjunctiva was still somewhat thickened, so that the edge did not close completely over the globe. The patient received no further treatment for about nine months, during which time an ectropion of the right eye, with an eversion of the conjunctival membrane over a space about one-half a centimeter broad, developed itself. This was again reduced by forty-five massage-sittings in which vaseline was used. When the report of the case was written out, there re-

mained considerable thickening of the mucous membrane for further treatment. The left eyelid, with the exception of a slight amount of injection, had continued normal.

2. Hedwig G., 54 years old, had a trachoma of almost twenty years' standing, together with a complete ectropion of the lower lid of the left eye, with everted, whitish-yellow, xerotic mucous membrane, traversed by stringy cicatrices and a broad posterior symblepharon. The right lower eyelid was ectropic, and everted throughout its inner half, and had undergone similar though less pronounced changes than those affecting the left eyelid. After sixty-five sittings, in which vaseline was used, the conjunctival mucous membrane was visibly healthier and less xerotic. After eighty-three further sittings, or one hundred and forty-eight in all, the ectropion of the right eye had almost disappeared, *i. e.*, there was no longer any eversion, though complete closing of the lids was still not possible. In the left eyelid the mucous membrane was healthier and less xerotic, but the ectropion was, in the main, unaltered. The final result, after thirty-five more sittings, or one hundred and eighty-three in all, was about the same.

Abadie * has successfully massaged the orbicular muscle of the eye in blepharospasm. Schmidt-Rimpler has removed œdema from the eyelids, in blennorrhœa, by means of massage. Stedman Bull has employed massage in scar-like deformities of the eyelids, in order to prepare the way for operation by making the tissues softer and more mobile.

Diseases of the Interior of the Eyeball.

Massage is now frequently employed in the treatment of cataract. Junge, Chopin, Becker, and others recommend it as a means to promote resorption after discission, which is customarily employed in soft infantile cataracts, in order to effect the absorption of the mass of the lens through the influence of the aqueous humor upon the lens. When, in the form of cataract adapted to this operation, the capsule of the lens has been properly opened, the lenticular mass is forced out, by friction upon the sclera, into the anterior chamber, whereupon its absorption is effected by massage of the lid upon the cornea. In such cases it is necessary to make sure of the absence of all irritation of the iris, and to perform the manipulations cautiously. We must also bear in mind that massage, without doubt, increases the already imminent danger of iritis.

Van der Laan has employed massage to promote resorption in *traumatic cataract.* In a case of linear wound of the cornea and iris, the greater part of the swollen lenticular mass was pressed

* Nagel's Jahresbericht, 1883, p. 486.

forward into the anterior chamber and there absorbed through the rubbing made by the five-year old patient himself; and the glaucomatous symptoms disappeared within twenty-four hours. (Centralblatt, 1881, p. 446.)

Trituration of the Cortex or massage to promote ripening of the cataract.* Massage belongs among the procedures which have been attempted in order to abridge the time between the first appearance of the opacity of the lens, with its concomitant disturbance of the organ of vision, and the ripening of the cataract (the stage in which the lens can most easily be separated from its capsule, without leaving behind any residue of its cortical substance).

Those who have acquired from a medical faculty the right "of being let loose upon the public," all know that the stage of maturity differs both from the foregoing immature stage, and the subsequent over-ripe stage, by reason of the fact that, in the mature cataract, the disorganization of the lenticular filaments extends to the periphery of the lens before the complete destruction of those filaments has taken place; that the lens is then entirely opaque, dull gray or brown in color, and is usually full of plainly-marked radial streaks; that the "iris-shade" is destroyed; that the lens, as a whole, is somewhat shrunken; and that the anterior chamber is quite normal in size.

As is well known, attempts have been made to cut short the full course of the lenticular trouble, by making an incision in the anterior wall of the capsule and exposing the lens to the influence of the aqueous humor. Attempts have also been made to attain the same end by a preparatory iridectomy, the influence of which is yet a matter of dispute, though its efficacy has been abundantly determined.

Förster, of Breslau, hit upon the idea that the preparatory iridectomy hastens the ripening of the cataract, so that the lens, being moved forward by the discharge of the aqueous humor, undergoes a change of form, a dislocation of its parts amongst themselves, and that the cataractous falling to pieces of the part in question is thereby promoted. He inferred that a similar dislocation of the lenticular elements could best be effected by massage, if it were made upon the lens, in the empty aqueous chamber, immediately after the iridectomy had been performed. A series of cases, approaching five hundred in number, attests

* A good work on this subject, which has been used to some extent in the above account is "Om Konstjord Starrmognad" ("On Artificial Ripening of Cataract"), Nordmann, Helsingfors, 1885.

the correctness of his view. This massage of the lens, undertaken immediately after the iridectomy, in order to bring about the ripening of the cataract, has gained a place for itself among ophthalmological procedures, under the name of cortex-trituration. It now holds a very respectable position, but one had better not express an opinion concerning its permanency; above all, one who is not an ophthalmologist.

Förster employs cortex-trituration only in cases of cataract having a hard nucleus. In cases of choroidal cataracts, which leave a large part of the lenticular mass transparent, have no hard nucleus, and are composed only of a thin, cataractous opacity at the hinder pole, he does not consider it appropriate. Meyer demonstrated on a rabbit, at the Copenhagen congress, that a wholly normal lens may be rendered totally opaque by means of a vigorous trituration of the cortex, and considered the method applicable even in choroidal cataracts, and in soft cataracts in general, in which class of cases many ophthalmologists have employed it with success. Most of them, however, agree that it is most efficacious in cases of senile and nuclear cataract. The method has, however, powerful opponents, among whom are Alfred Graefe and De Wecker, who, in the main, ascribe but slight importance to ripening of the cataract in connection with extraction of the lens, and, therefore, do not favor means to promote it.

The massage is made in the following manner: immediately after the iridectomy, which is performed during anæsthesia produced by cocaine, frictions are made upon the cornea with a strabismus-hook, a spatula, or a particular kind of small, roller-like instrument devised by Meyer,* or, as so frequently is the case in eye-massage, friction is made by means of the eyelid; atropin is then dropped into the eye. Eserine should not be used, lest it increase the irritation of the iris. Förster then waits from four to eight weeks, most other ophthalmologists a shorter time, before making the operation for cataract, which is performed in the usual manner, after a preparatory iridectomy. Sometimes the cataract matures in a few days after the cortex-trituration. According to Meyer, it occasionally may be

* Rossander introduces a spatula into the anterior chamber and rubs with it directly on the capsule of the lens, a procedure whose obvious dangers, according to Nordmann, are scarcely offset by its advantages.

observed immediately after the massage of the lens. If the trituration does not prove efficacious, it may, a few weeks later, after puncture of the chamber has been made, be repeated with somewhat greater energy; or one may make a discission to promote ripening of the cataract, or wait for a "natural" ripening of it, or proceed to the cataract operation without further ado.

Trituration of the cortex is less dangerous than discission, but somewhat more dangerous than iridectomy, and is, perhaps, the most certain of the three methods for producing "artificial" ripening of the cataract. It is much surer than iridectomy. It is a somewhat slower method than discission, but is speedier than iridectomy in attaining its end. If complications exist, such as synechiæ, increased intra-globular pressure, etc., which would render a possible irritation of the iris worse than would otherwise be the case, one had better forego cortex-trituration and content himself with iridectomy. Similarly one had better not attempt cortex-trituration, or any other artificial means of producing ripening of the cataract, in those cases where a central opacity, which diminishes the power of sight, is sharply limited and leaves the cortical layer wholly untouched, since in these cases the application of an optical pupil is preferable to extraction. In other cases, for the present, cortex-trituration is the best means we have for producing artificial ripening of the cataract (Nordmann).

The dangers which attend trituration of the cortex are the same as those that accompany iridectomy. The danger of iritis in particular may be somewhat greater. If the cortex-trituration be performed with too much vigor, the zonula may be ruptured or the lens be dislocated. These dangers, however, are not very great, and, so far as I know, have never been determined to result solely as the result of massage.

Wicherkiewicz and Schnabel have employed massage in simple glaucoma, partly to reduce intra-ocular pressure and partly (Schnabel), for the sake of influencing the accompanying opacity of the cornea. It is certain that one can temporarily reduce intra-ocular pressure, but it is equally certain that this effect persists for only a few hours in such cases. Schenkl found that it lasted for twenty-four hours. In secondary glaucoma he found that massage produced real improvement. Some ven-

turesome people have attempted massage in cases of inflammatory glaucoma, but were forced to desist by their desperate patients.

Schenkl employed massage advantageously in hyphæma. Just (Zittau) has brought about resorption of hypopyon, *i. e.*, exudation in the anterior chamber, in a case of *ulcus serpens corneæ* in which an hypopyon three millimeters high disappeared after five sittings (in which light friction was made twice a day), thereby rendering a proposed operation after the method of Saemisch superfluous. However, it is obvious that we must not forget that an exudation in the anterior chamber may be due to an iritic as well as a keratitic process. In the first case, as has been many times said, massage is absolutely contraindicated.

Pagenstecher employed massage with the happy result of producing complete restitution, after fourteen days, in a case of disease in the *corpus ciliare*, which he took to be a well defined exudation around the ciliary nerve. This should be noted, but it ought not to be imitated except by experienced ophthalmologists. Klein, also, is inclined to employ massage in "substantive" ciliary neuralgias. (Centralblatt, 1882, p. 159.)

Mauthner, Hirschberg, Priestley Smith and Mules, recommend massage in embolism of the central artery.

Hirschberg has recently made the following report. (See Centralblatt, 1888, p. 296): On October 11, 1888, I was consulted by a gentleman 52 years old, who was in a very nervous state. On the afternoon of that day, while on the exchange, he had noticed a pain in his head, a glimmering before the right eye and a mistiness over the same. At home he had a subjective impression of light similar to fireworks for some minutes. The mistiness still remains before the eye. Although no cardiac symptoms could be perceived, an embolus of the retina must be assumed. Nevertheless it was not possible to make it out with the ophthalmoscope, since the patient could not hold the eye still a moment. Homatropin was dropped into the eye and the acuteness of vision tested. The left eye was normal; the right could not recognize Sn CC : 15′. He read + 6 ″ Sn XXX to 6″ and showed a characteristic sector-formed defect of the visual field, whose breadth embraced almost the entire upper quadrant, while the narrow point passed through the fixed point and extended to the blind-spot. An examination was again made by aid of the ophthalmoscope. The inferior temporal artery of the retina was normal for the breadth of four papillæ; the color of the blood was also normal; then followed a short space, of the breadth of one-third of a papilla, where the vessels contained a brown linear clot, whose boundary was clearly discernible both above and below as a fine whitish line; then followed, after a very short interval, a dark brown object on the remoter, broader, arterial twigs which were invisible in parts, so that the arterial tube appeared to be interrupted. That is to say a delicate œdema of the retina was recognizable, but the red part, at the very centre, was not sharply defined. Pressure upon the eyeball, in the restless condition of the patient, yielded no decisive symptom. It appeared to me that the upper branch of the artery was constricted, the lower not. I directed the patient to turn the eye toward the nose and I made vigorous friction upon the posterior temporal side of the eyeball until pain, tears, and sensations of light at the end of a minute demanded cessation of the friction. The patient experienced immediate improvement, as to vision; but a renewed more accurate examination was dispensed with as being unsafe. On the way home the sight became normal. Next morning, acuteness of vision, the

visual field, and all disclosures by means of the ophthalmoscope were such as one finds in a healthy eye. Whether the case improved spontaneously or not I do not know. I considered the remedial procedure which was adopted to be clearly called for.

Mules, also, cites a case of embolism of the retinal artery which was cured by means of massage. (Ophthalmological Society of the United Kingdom, 1888, July 6.)

Diseases of the Orbit.

Tenonitis (of the right eye), or the affection which is usually designated by that name, has been treated by Gradenigo * with massage. The case exhibited marked exophthalmus as well as a hard, resistant filling out of the whole orbit, swelling of the lids, chemosis, severe pains, insensitive cornea, immovable globe of the eye, no perception of light, in addition to general disturbance and attacks of fever. These symptoms were developed gradually in a woman who had formerly been entirely well, and was received into the clinic for the purpose of undergoing an enucleation of her eye. Fortunately the attempt was made to treat her with massage, which led to improvement and "after a short time to complete restitution." Scellingo has also employed massage with brilliant success in a case of tenonitis. It is obvious that massage may hasten the disappearance of the characteristic symptoms in these cases, which are wont to run their course pretty quickly, even without treatment. Before one begins the treatment he ought, after the manner laid down in all ophthalmological handbooks, to arrive at a differential diagnosis between tenonitis and phlegmon of the orbit, as well as panophthalmitis and thrombus in the cavernous sinus.

I am prompted to call the attention of the reader, in a special appendix to this chapter, to the importance of massage in certain anomalies of the eyes which arise through irradiation- or reflex processes starting from other peripheral parts. It has been known for a long time that ocular symptoms may have such an origin, and our enhanced knowledge of the extra-ocular pathological origin of such symptoms has contributed its part † towards

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* Atti del associazione ottalmologica italiana sessione di Padova, Settemb., 1882. Annali di Ottalmologia, 1883. (Cited by Kiär.)

† The number of eye-neuroses has been limited, not only through our more accurate knowledge of defects arising from refraction and accommodation, but also through the discovery of central causes for functional disturbances of the eye. And in cases which formerly would have been attributed to nervous asthenopia but now constitute the so-called dyslexia, changes have been discovered in the third convolution of the cerebral hemisphere.

reducing the number of cases that used to be classed as pure neuroses of the eye; a limitation analogous to those which have taken place, for the same reason, in other branches of medicine.

Thus, it has been known for a tolerably long time that foci of inflammatory irritation in the dental apparatus, in the cavity of the nose, or of the ears, or in the female genitalia, might cause a complex of symptoms on the part of the eye, which at an earlier time would have been considered as diseases of the eye having an undoubted primary origin. So, also, we know that neuritis of the ramifications of the ophthalmic branch of the trigeminal nerve may give rise to analogous phenomena; and this is the reason that so many have confounded supraorbital neuritis, *i. e.*, neuralgia and migraine, with the above-mentioned symptoms of eye trouble which are often prominent. (See Chapter VIII of this work, especially Henschen's case, on p. 109.) It should also be remembered that such neuritis or perineuritis may be only partial manifestations of more extensive subcutaneous, so-called rheumatic, inflammatory processes. Finally it is clear, from the observations of various physicians made independently of one another, that processes of this kind, in certain muscles of the neck and head, may give rise to the same kind of sensory and functional disturbances of the eye.* Rosenbach mentions the frontal, occipital, temporal, sternocleidomastoid, and trapezius muscles in this connection.

The ocular symptoms which usually arise through central irradiation, from more or less distant extra-ocular foci of irritation, are pain, photophobia, scotoma, heaviness of the lids, hyper-

* In 1884 I had such a case in the person of a young woman who, without any other objective changes within or without the eye, suffered from pain in the eye, asthenopic trouble, and at the same time had extensive infiltrations in both trapezius muscles. The patient, without having any other treatment, was freed from the ocular symptoms in direct proportion as the muscular infiltrations yielded to massage and she herself, as often happens in these cases, attributed the infiltrations to her eye troubles. At that time I did not know of any similar observation, and did not venture to draw any conclusion from a single case. After a while I had a few cases which put me in mind of the first. I then learned from Dr. Widmark, of Stockholm, to whom I related the case, that he had just then seen such a case for the first time. He has since recounted various interesting cases, among which myitis occurs as the cause of ocular symptoms, in a recent essay upon "Ogonsymptom vid perifera trigeminus-affektioner." = Ocular symptoms in peripheral affections of the trigeminus (Nord. Ophthalm. Tidskrift, 1889). It was not until long after my observation, noted above, that I found that it was not at all new, inasmuch as different ophthalmologists (whom I do not name here, since they have published nothing about it) had made similar observations and that Rosenbach had called attention to the matter before Widmark's account or mine was published. (See "Ueber die auf myopathischer Basis beruhende Form der Migräne." Deutsch. Med. Wochenschr. 1886—cited amongst others by Hirt, p. 51, in his "Pathologie und Therapie der Nervenkrankheiten.")

aemia, excessive flow of tears, and even chemosis. It seems to me that the most frequent phenomena are ill-defined pains in the eyes and their neighborhood, as well as asthenopic difficulty in reading. These affections may resemble attacks of migraine, in that they are subject to periodical exacerbations, and may resemble still more a nervous, hysterical, or also a muscular or accommodative asthenopia—most frequently the latter if they happen to coincide with an anomaly of refraction, such as astigmatism or hypermetropia.

Moreover, according to my belief, which in this case needs to be corroborated by the experience of others, peripheral infiltrations also give rise to motor reflexes, especially from the centre of the facial nerve, and thereby cause blepharospasm. Such was, I think, the fact in a case of my own, which I adduce below.

It is evident from the foregoing that when the above-mentioned sensory and functional disturbances appear in the eye of a patient, one is confronted with a tolerably complicated problem in diagnosis. First of all we must look for diseases of the eyes, especially for anomalies of refraction, and for accommodative, as well as muscular, asthenopia. We must keep in mind, moreover, such general causes as chlorosis, anæmia, and neurasthenia; must neither forget the purely nervous asthenopia (Förster's *copiopia hysterica*), nor to make careful search for foci of irritation in the mouth, the nose, the ears, or the female genitals. Furthermore, it is necessary to palpate the head, and, above all, the forehead, over the supra-orbital nerve, for rheumatic infiltrations and neuritis, according to the manner already described on page 105, as well as to make examination for myitis (see p. 93), especially of the above-mentioned muscles. Finally, after all these precautions, one must not forget that many causes may work together, and that when many changes exist in a given case, any one of which may be the origin of the trouble, we can never determine, *à priori*, whether, or in what degree, any change is the occasion of the ocular symptoms.

The function of the masseur comes in question chiefly in those cases where a subcutaneous infiltration, neuritis, and perineuritis, or myitis is concerned, and is to be performed after the method, already described in various places in this book, which it is not necessary for me to cite here. So, also, massage may be con-

sidered when abdominal affections exist, for instance, in cases of parametritic exudations.

I bring forward here: a very interesting case, which Dr. Nordenson has orally made known to me, in order to show the necessity and success of accurate examination; a case from Widmark's work, cited above, which seems to me typical; and also one of my own most striking cases which relates to the existence of blepharospasm due to the irritation caused by muscular infiltration.

1. Nordenson's case. W. B., seventeen years old, a school boy. The patient, who in other respects is entirely well, has, during the last two months, when reading, felt pain in his eyes and a sense of weight over his forehead, on account of which he has been obliged to give up studying. Nordenson's examination of the eyes, January 13, 1889, disclosed hypermetropia of 0.50 dioptrics of the right eye; emmetropia of the left eye; no astigmatism; while the acuteness of vision of both eyes was normal. Near point at ten centimeters' distance.

The patient had pains in both supraorbital nerves, chiefly over the left one. The forehead was very sensitive to percussion with the fingers, particularly so over the frontal sinus. There was no painfulness or thickening, when the skin over the forehead or in the neighborhood of the eyes was raised and pinched.

The patient was sent to a masseur and received massage over the supraorbital nerves; but it gave rise to severe pain and did not diminish his discomfort when he tried to read. As the patient became worse rather than better from the treatment it was discontinued.

Dr. Nordenson now sent the patient to Dr. Kjellman, a specialist in diseases of the ear and nose, who found an empyema in the right antrum of Highmore. The patient was then sent to a dentist, who removed the first upper molar tooth, which showed a periodontitis, and bored out a canal from the floor of the alveolus, through which a somewhat ill-smelling and discolored secretion was removed. Therewith, and under continued after-treatment, following the operation, the above-described troubles of the eye disappeared.

2. Widmark's case. J. M., a school-boy, aged eighteen. The patient has been troubled at times, for nearly a year, by pain in the left eye and photophobia; the pain appears chiefly when reading and similar work is undertaken. For the last three weeks, on this account, he has had to give up his studies and remain entirely quiet.

The examination disclosed hyperopia, amounting to 0.75 of both eyes; in other respects, however, nothing abnormal. V = 1.0, p. = 10 cm. Tension, etc., normal. General condition good. There was nothing found in the condition of the eye to account for the pain. Hyperopia of 0.75 was determined, to be sure; but a similar degree of hyperopia, by itself insignificant, existed in the right eye. On closer examination, Widmark found that when the pain was slight, particularly when it was felt in the left temple close to the eye, and that when the attacks were more severe, not only the eye but the whole half of the head on that side ached, and that the left arm was weak for a considerable time. The patient had especial difficulty in bringing the arm to a perpendicular position. Acting on this hint, Widmark found a sensitive œdematous spot on the temple, and at the same time an infiltration in the anterior upper edge of the left cucullaris muscle. Massage was begun upon this spot, and was continued every day for a fortnight. It produced an astonishingly quick effect. When the patient, after two weeks' treatment, returned to his home, he had for seven days had no attack of pain. He could also move his left arm as freely as the right. There existed, however, when the treatment was discontinued, some sensitiveness and

swelling in the shoulder as well as in the temple. Widmark was, therefore, the more surprised when he heard from a relative of the patient, one year later, that he continued well.

3. A case of my own. Mrs. W. S., from Chicago, something over thirty years old, came to Carlsbad on account of a gastro-intestinal catarrh. The patient further complained that for three weeks she had been troubled with pain and stiffness in the neck. During our interview I noticed a severe blepharospasm of the left eye, and the patient in reply to my question as to its age, said it was coterminous with the other trouble, and ascribed both to catching cold. On examination, nothing abnormal was found except that a large, fresh infiltration, characterized by perceptible swelling and marked susceptibility to pressure, could be palpated in the upper part of the left cucullaris muscle. For the next two weeks the patient received daily massage, exclusively in the region mentioned. After a few days the patient remarked that massage of the neck had perceptibly good effect upon the blepharospasm as well as upon the local pain and stiffness; as the last diminished so also the blepharospasm disappeared. It had never previously occurred to the patient that there was a possible causal connection between the myitis and the blepharospasm, and I purposely refrained from suggesting it to her.

CHAPTER XIII.

DISEASES OF THE GENITO-URINARY ORGANS.

A. Diseases of Women.*

Gynæcological massage, which is generally known now throughout most of Europe and a part of North America, owes its introduction chiefly to Major Thure Brandt,† a retired Swedish army officer, who is still living. This form of treatment

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* The exposition herein set forth is based on a very limited personal experience, though I have gained that experience in the first place, by seeing Brandt give massage several times, and later on by applying massage myself in my own practice, to a series of parametritic and perimetritic exudations (chiefly in 1884-85). My account of the technique faithfully sets forth the essentials of Brandt's method. Even those features of it that I look upon as unimportant and mischievous, are set forth for the sake of completeness and of just criticism. I have likewise described the treatment of prolapsus (descensus) uteri, according to Brandt's very peculiar method, in just the way that Brandt was good enough to demonstrate it to me. Though I have had no experience with this particular form of the treatment, Brandt has achieved strikingly good results with it; results, moreover, whose genuineness has been indisputably determined. I have cited under each disease an appropriate case taken from the account, published by Dr. Profanter, of cases treated by Brandt himself, under the control of Prof. B. S. Schultze (of Jena). Profanter's accounts are based on the journal-notes made by Schultze on Brandt's cases. Owing to their complete and generally recognized credibility, these cases are of great importance.

† Certain forms of massage of the uterus, *e. g.*, rubbing upon the belly-wall in order to allay post-partum bleeding, are of immemorial standing, in all probability. Certain French physicians—Caseaux, Laisné, Phelippeaux, Recamiers, Valleix—in our own day, have recommended or employed massage, contemporaneously with or even somewhat before Brandt, in a notable number of different abdominal diseases peculiar to women. But such occurrences were quite rare in France, where this form of treatment, even in 1870, aroused peculiarly violent opposition on the part of the authorities in medicine. (See Norström, Massage de l'uterus, Paris, 1889, page 7.) The merit of being the first to force the treatment, so to speak, upon the physicians, through his own wholly independent and energetic labor, and thereby to cause its definite adoption in the field of medicine, cannot be denied to Thure Brandt. This man, who is the most meritorious of Swedish gymnasts now living, took his first steps in the mechano-therapeutical path as long ago as 1847, though his first labors in the service of gynæcology date from 1861. His activity in this field immediately aroused great attention, which, as may be readily imagined, was very dissimilar in its character. Brandt's writings, which are not wholly free from the faults common to "gymnasts," and show marked traces of layman's workmanship, and which do not accord with his practical efficiency, which is in many respects highly meritorious, contributed to render the Swedish physicians unfavorably disposed toward him. Many of them went too far in their wholly natural attempts to uphold the medical faculty as the "sole source of salvation," and laid themselves open to the reproach of passing judgment on a matter which they had not thoroughly investigated. Moreover, the judgments uttered against Brandt were, in a measure, partly or wholly unjustifiable and, in a measure, rather silly. For example, it is hard to understand why the Brandt-treatment should outrage female modesty any more than our examinations and therapeutical measures that are necessarily "inconsiderate of" and disagreeable to those concerned in them. Meanwhile Brandt (who made himself

has become so well accredited during the last few decades that no physician can afford to ignore it.

In gynæcological massage, which, be it said, usually constitutes only a part of the manual treatment in abdominal diseases of women, the principal manipulation consists of frictions. These are employed for the most part to remove the residual effects of inflammation; but, sometimes, recourse to them is had for the sake of exerting an influence upon torpid inflammatory processes or to remove extravasated blood.

Inasmuch as the treatment* of these conditions is the same and wholly accordant in all cases, I shall consider it at this point once for all, for the sake of simplicity and directness, and then subjoin such remarks regarding it as are particularly called

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thoroughly familiar with the anatomy pertaining to his work, and, aided by great natural talent, acquired remarkable skill in palpation and manipulation) gained an extensive practice, and effected many happy cures. In 1870 the talented Dr. Sven Sköldberg, since dead, took full cognizance of the "Brandt-method" (which Brandt, who is still extraordinarily energetic, though over seventy, now as ever demonstrates with great readiness to every one who can make good use of it). This facilitated the introduction of the method to many Scandinavian physicians and gynæcologists. Netzel and Sahlin, in Stockholm, Asp, in Helsingfors, and Howitz, in Copenhagen, took up the massage, and in this connection I must also make recognition of Nissen, of Christiania. On the continent Mezger was also active in this field, but Bunge was the first to write anything serviceable about it. Bandl, Hegar, Martin, Schröder, and other gynæcologists of great authority, by their recognition of gynæcological massage, soon contributed greatly to its spread; and in addition a considerable number of German physicians obtained from Brandt himself a knowledge of his method. In America, Reeves Jackson has done good service in the same line. An important step toward the final establishment of the standing of this procedure was taken in November, 1886, when Brandt, at the suggestion of Dr. Profanter, who had seen his work in Stockholm, went to Jena, where he personally treated a series of cases exclusively by his own method, but under Schultze's careful control. There is no doubt that these cases, Profanter's published accounts of which were taken from Schultze's journal, will win recognition for the method, so far as such recognition remains to be won.

* In the German literature on this subject some outrageously unfair utterances are to be found concerning Brandt's massage. It is scarcely less provoking to find authors who have written concerning massage in gynæcology and set forth its indications, contra-indications, prognosis, "casuistry," etc., in a detailed way, completely neglecting the technique, of whose nature they are fully cognizant, since they state, with great presence of mind but with little justice, that the manipulations must be seen to be understood, and cannot be apprehended from any description. But the truth is that it is a particularly easy matter to describe gynæcological massage, so that any one who is versed in his anatomy, and is furnished with approximately normal powers of comprehension, can understand how it should be carried out. I should like to know what in the world there is to hinder a physician, with any skill whatever in palpation and diagnosis, from beginning to massage his own cases and gradually becoming expert in this treatment, being guided by a description of the *per se* extremely simple manipulations. The most essential difference between his first and last performances in this domain may well consist in this, that he will be somewhat slower at the beginning in attaining his results. It is pure nonsense to consider massage as a horribly difficult thing *per se*, and it is wholly unjustifiable to make a secret of the way in which it is performed.

for under the head of each separate form of disease, together with a description of one or two apposite cases. Brandt's treatment of prolapsus of the uterus will thereafter be specially considered by itself, as it deserves.

During the massage-sitting, the patient lies upon a couch with her head, and preferably her buttocks also, somewhat raised, her legs are flexed, and, like her feet, whose soles should rest throughout their whole extent upon the couch, are abducted. One purpose of this position is to render the abdominal wall relaxed. The masseur sits on the patient's left, close to her pelvis, with his face turned in the direction of her face. This position enables him to pass the left forefinger with ease under the patient's thigh and to introduce it into the vagina as far as the posterior fornix, so that he can lift the uterus and its adnexa, particularly those parts that require massage, and support them against the abdominal wall and his right hand, with which he performs massage upon the same. The left hand should be held open with the last three fingers along the perineum, the thumb somewhat removed from the symphysis pubis, and the forefinger (leaving out of account the slight movements requisite for lifting the different portions of the uterus, etc., against the belly-wall) immovable in the vagina, against one of its side walls or the posterior wall, never against the anterior wall. This is also an extremely convenient position in which to make an examination by means of palpation. With the middle three fingers of his right hand placed together, the masseur makes pressure through the abdominal wall upon the part to be massaged, and executes small, circular frictions, similar to those described under abdominal kneading (see page 48), in accordance with the ordinary rules of procedure, of which rules we will repeat only one here, viz.: that the manipulation should be begun on the side nearest the vascular centre. This form of manipulation seems to me to be the only essential one in those cases where our sole object is to remove exudations or infiltrations.

In a numerous class of cases where, in addition to residues due to inflammation, we have to deal with a change in the position of the uterus or a diminution of its mobility, the massage must always be supplemented by other forms of manipulation, long since customary in gynæcology, whose purpose is to stretch

shortened or shrunken tissues. I shall consider them more in detail further on.

When he has introduced his left forefinger into the vagina and placed his right hand on the abdomen in the position described above, Brandt begins the sittings with strokings executed by the right hand over the underlying lymph-vessels, in order to quicken the circulation within them and to empty them somewhat of their contents. When we consider how unfavorable the anatomical conditions are for securing this end, the procedure in question can hardly be of great value.

Brandt is particular, under all circumstances, to work with only one finger, namely, the forefinger, in the vagina. Various physicians, who have made much use of this form of massage, usually introduce both the forefinger and the middle finger into the vagina. At first I found this method better and less tiring, but later I gradually accustomed myself to use the forefinger alone.

Towards the end of the sitting Brandt causes the patient, by her own exertion, to raise her buttocks and the lower part of the back from off the couch, so that she touches the latter only with her neck, the upper portion of her back and with her feet. While she is in this position, he executes certain abduction and adduction resisted movements with her legs, *i. e.*, he causes the patient to make the movements named, to which he interposes a certain amount of resistance by grasping both the patient's knees with his hands. By means of the abduction movements he aims at leading the blood away from the pelvis. Brandt uses resisted-adduction in order to strengthen the floor of the pelvis; hence they belong properly to the treatment of prolapsus, to which we shall recur later.

Finally, at the end of the sitting, Brandt employs certain forms of "laying on of the hands" and of "nerve-pressure" (over the pudendal nerves) in order to allay irritation, or, as it were, "to smooth over the whole procedure," which manipulation may *surely* be omitted with advantage, and, according to my way of thinking, *should* be omitted, for obvious reasons. Still it must be allowed that there is much of exaggeration and injustice in the reproaches often brought against Brandt, on the ground of his not fully comprehending and forefending the danger of producing sexual stimulation of the female genitals. For example, I have never seen Brandt employ the notorious "vaginal-vibrations," and when I asked him about them he replied that he never employed them.

In young persons and virgins the required support is obtained by placing the forefinger in the rectum instead of the vagina.

Sittings in gynæcological massage vary in length according to the nature of the case in hand. Their mean length may be given as about fifteen minutes. The patient should empty her bladder just before the sitting begins. When the manipulation is executed per rectum that must also be empty.

Touching the contraindications against abdominal massage, the reader is referred to the general considerations set forth on pages 71–73. I will only remind him, here, that pregnancy in all its stages must be considered a positive contraindication; and that the same considerations hold good that are valid in all

inflammatory processes, above all in those that are purulent, *e.g.*, gonorrhœa. In gynæcological cases the effect of massage upon the nervous system may not infrequently forbid our continuing it. Finally, it is self evident that we should not give massage during the menstrual period, partly because the treatment is too disagreeable for the masseur and the patient alike, and partly because it is certain to increase the flow of blood.*

Gynæcological massage belongs, with extremely few exceptions, to the physician: this dictum is none the less justified because this form of massage chiefly owes its first entrance into the world to a layman. It presupposes, even with adequate knowledge of the pertinent normal and pathological anatomy, a far from easily attained skill in palpation and diagnosis, and demands, in a higher degree than any other form of massage, a knowledge of all possible accidents that may arise,—this can only be gained from tolerably extensive medical studies. It is my positive conviction that no one who does not possess such knowledge can perform gynæcological massage without, at least in the beginning, paying pretty dearly, at his patient's expense, too, for the requisite caution that can only come through one's own experience in such cases. If the physician in cases of this kind will not or cannot himself give the massage, then he ought to renounce treating the case in this manner, or else send his cases to a medical colleague.† Most may well be strongly inclined to seize upon the latter expedient. Pelvic massage is extremely fatiguing, especially for the finger or fingers employed to lift the uterus against the massaging hand. Since it has other peculiarly disagreeable features in addition, a non-specialist easily becomes tired of it, and is glad to avoid it.

Pelvic Exudations.—Parametritic and perimetritic exudations, especially the first named, are the forms among female pelvic diseases that are, above all, adapted for massage. There exists, nowadays, a tolerably large number of gynæcologists who are in a position to compare the results of their treatment of these affections without massage with the results they have later attained

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* Yet there are "massage-specialists" who go so far in their enthusiastic energy that, like Brandt, they pay no regard to either of these circumstances, but give massage also during the menstrual period.

† So far as they happen not to be in Stockholm, and have Major Brandt at hand; for such alone I make an exception.

through the use of the same. The opinion of such concerning the value of massage in this connection may well be quite unanimous. Residues from inflammation are more quickly and completely removed than by any other means; and with them the danger of a relapse, for the most part, also disappears. So far as the simultaneous changes in the position and mobility of the uterus are concerned (to which I shall return below), we must admit, without reserve, that *complete cure* is rather the exception than the rule, especially in retroflexion and fixation. But it can be said, on the other hand, that there is usually sufficient improvement to abolish the concomitant annoying symptoms.*

Nevertheless, the treatment is by no means without its perils, so far as parametritic exudations are concerned, and in a still higher degree, as regards perimetritic exudations that are usually combined with them. The danger consists in this: a new inflammation may be caused either directly by mechanical irritation, or indirectly by the expression of the hitherto encapsuled but still irritative elements. The shorter the time which has elapsed since the inflammation was acute, the more imminent are such dangers, which forbid our placing a one-sided and extreme estimate upon the greater ease with which we can massage away

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* In this chapter, as in general throughout this work, I have passed over certain uses of massage that I look upon as objectionable. Thus I wholly disregard massage of fibroids, without stopping to consider the diminution in their size, or the diminution of the attendant bleeding which one and another claim to have observed. And I have just as little belief that massage will answer in cases of ovarian cysts of any kind, under any circumstances whatever. Finally, I consider it inexpedient to attempt, by mechanical influence, to bring about bleeding *directly* in chlorotic-anæmic patients suffering from amenorrhœa. Such patients are not anæmic, because their menses have stopped; but the menses and all ovulation have come to an end because of their lack of blood, and this disappearance is to be looked upon as an economical attempt of Nature at compensation. To attempt to cause bleeding in any other way than by removing the primary cause of the affection can not only not be useful to the patients, but must also still further promote their poverty of blood. Brandt treats such patients by means of general gymnastics, which include certain "inciting movements." I hold that the general gymnastics are useful; but can say nothing about the "inciting movements," as I am not familiar with them. The only massage procedure, however, that is employed in this treatment, namely, tapotement over the sacrum, may well be omitted altogether. The fact that patients who receive general gymnastics during the treatment, being frequently placed under new and improved hygienic conditions (they frequently come as travelers to Brandt), are not seldom favorably influenced is no proof of the propriety of attempting to bring about hemorrhage directly. Brandt also treats dysmenorrhœa by means of "inciting" gymnastics and tapotement over the sacrum, a procedure concerning which I do not venture any expression of opinion, owing to my complete lack of experience in the matter. I may also be allowed to disregard the question in this work, on the ground that this treatment belongs almost wholly to gymnastics and not to massage.

fresher exudations than we can the older. When we remember how completely residues of many years' standing may be removed, we should not attribute too much importance to the annoyances which may arise from them should we allow one or two more weeks to elapse, if it seem necessary, before we begin with massage-treatment. The proper time for beginning this varies much in different cases. At the same time we may easily set a minimal interval which must elapse between the last symptoms of the acute inflammation (marked tenderness on pressure, increase of temperature, etc.) and the first massage-sitting. In my opinion such a minimal interval should not be less than two months, and in a large number of cases, in which the examination of the exudation by means of palpation affords an excuse for it, I would wait a still longer time. The characters, aside from the greater age, that distinguish the less dangerous exudations, and may in their own degree serve as an indication, are firmer consistence and a less degree of sensibility to pressure. If this treatment is begun at an early stage of the exudation, one must go to work with extreme caution—much more so at first than later—and stop the massage at the slightest sign that it is occasioning an acute inflammation.

In this connection I take the liberty of calling emphatic attention to the necessity of allowing a considerable time to elapse between other analogous inflammatory processes and the massage treatment of the residues, indurations, etc., etc., that follow them. To talk of massage in connection with the phlebitis and lymphangitis that accompany phlegmona of the thigh, which we call phlegmasia alba dolens, is absolutely absurd. So long as such a process continues it constitutes a most serious contraindication against massage, and can only be considered as a means for removing the residue several months after the healing is completed.

Massage may be performed in the same position and in a similar way to that described already, in case other inflammatory residues occur within the lesser pelvis, or when the existing processes are of a completely torpid nature. Especially in perioophoritis and in oophoritis (which cannot be separated in practice and are therefore considered together here) massage is often employed with advantage. In these cases, too, we remove exudations quicker than by any other means, and with

them the pains vanish; whereupon we may frequently the more easily stretch the existing adhesions and restore the displaced ovaries to their proper position. Enlarged ovaries frequently maintain with stubbornness their increased volume in spite of massage, although, clinically speaking, this is a circumstance of no importance whatever.

In a work of this sort, it is, however, of much more importance to point out the dangers of massaging enlarged ovaries than to set forth the indications which affections of this nature may present for massage treatment. Massage in these cases is of comparatively little significance. To begin with, the diagnosis demands an amount of skill in palpation which among general practitioners is possessed by the minority only, perhaps; and those of us who are able, in these conditions, to exclude changes in the tubes, which may entail great peril upon mechanical interference in their neighborhood, are still fewer in number.

So far as inflammatory processes and their sequelæ in the tubæ are concerned, I hold that they constitute a contraindication against massage in their immediate neighborhood, even for the great majority of physicians. I will not wholly oppose the idea that various inflammatory changes in this connection may be successfully treated by means of massage, or that they have been so treated in very many cases; but to distinguish the cases in which this may happen without danger, from those in which it involves more danger than advantage, is a problem that may present great difficulties, even for a specially-trained and skillful gynæcologist. If a purely serous, salpingitic exudation is evacuated through the abdominal orifice of the tube into the abdominal cavity, the event is not a dangerous one. Frequently, too, one of the cyst-like expansions of the tube may burst without its thereby giving rise to symptoms that should cause anxiety. If, on the other hand, never so small a purulent exudation capable of starting an inflammation flows over the peritoneum, then we must face an event of the gravest nature, that suggests the immediate prospect of a peritonitis. There are cases, in the unwritten annals of gynæcology, which have come to my knowledge, that demonstrate these very dangers.

Salpingitic processes, in the future, as in the past, will assuredly give the surgeon more to do than the masseur; even though a

routine specialist may be able, by means of massage, to remove thickenings, swellings, and the sensitiveness which they occasion in the tubæ.*

Parametritis posterior chronica. Oophoritis chronica. Cystitis levis (*Brandt's† case, reported by Schultze, published by Profanter*). Charlotte J., 20, single. Previous history: had the usual diseases of childhood; has frequently suffered from throat troubles; menstruated first in her thirteenth year. In her eighteenth year her menses became irregular, with intervals of five to six weeks; the flow of blood, which lasted five or six days, was moderately copious, but was unattended with pain. From her nineteenth year her menstruation has been regular again. Since the end of August, 1886, the patient has suffered, outside the menstrual period, too, from a dragging sensation in the abdomen, which is most severe toward evening; from painful urination, and burning after it. She is obliged to urinate ever half-hour when up, and every two hours when lying down.

The patient is fairly well-nourished; her mucous membranes are rather pallid; so is her countenance. Abdominal wall taut; no striæ; slight inguinal hernia on the right side. Perineum intact; hymen without any deep lesions, has an erosion to left of it. Introitus vaginæ pervious to two fingers. Vaginal portion narrow and situated at the level of the spinal line. Uterus anteflected at an acute angle, normal in size, not painful. Movement of the cervix impeded anteriorly, resulting from a left-sided posterior parametritic exudation; left ovary hard, moderately large, painful. No painfulness to the right of the uterus. No. 4 sound passes only as far as the internal orifice; No. 3 passes through a distance of seven centimeters without resistance.

At first the patient is put to bed and is given tampons of glycerine and iodide of potassium, warm salt-fomentations, enemata, and washing out of the bladder. Brandt began his massage November 18, when all other treatment ceased. The uterus is fixed posteriorly; the left fold of Douglas is tense, shortened, much thickened, and painful; the left ovary is also tender on pressure; the abdomen is tense; she has frequent micturition, constipation, sense of pressure in the head, and cold feet.

The treatment consisted of massage like that described above, together with stretching of the shortened left fold of Douglas. From November 20 on, the movements of the bowels were regular. Micturition is less frequent, and there is very little pain after the evacuation of urine. November 21, 22, and 23 the patient was away on a journey. November 24 the treatment was resumed. On November 25 the uterus can be very easily placed in the median position and put straight; the left fold of Douglas is only slightly sensitive on pressure and is of nearly normal thickness. The patient, by her own wish, was discharged on December 4 and reported for the register: "urgent micturition and painful urination have completely disappeared; so, too, chilly feeling in the legs, and the headache has abated. Movement of the bowels is wholly regular, and I feel completely well. Have no pain under massage or examination, or otherwise."

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* See, further, Theilhaber's article in the Münchener medicinische Wochenschrift, 1888, Nos. 27 and 28; and also Winawer's article in the Centralblatt für Gynækologie, 1888, No. 52.

† In making use here of one of the Brandt-Schultze cases, I would remind the reader that Brandt (as I can testify myself) is able, on account of his extraordinarily perfect technique, to attain quicker results than a less expert masseur can bring to pass.

On examination the uterus presents an acute-angled anteflexion, with the fundus to the left of the median line. The uterus can be moved anteriorly nearly to the symphysis pubis without causing pain.

It is proper, in connection with the influence of massage upon inflammatory residues in the neighborhood of the uterus, to speak also of its influence upon the displacements and the diminished mobility of the same. Every one, who has made himself familiar with massage, will readily admit that it is in just these numerous cases of displacement from inflammatory residues that a particularly important part in the treatment falls to the lot of massage, and that here we are justified in expecting relatively good results from its use. Here, massage should always be used in connection with other manipulations, that do not belong to massage, which, however, are made use of in order to strengthen shrunken parts. With displacements which are caused by means of tumors within or without the uterus massage has nothing to do. In congenital conditions of this kind, as well as in those conditions which depend upon relaxation in the adnexa, the worth of massage, which for the present cannot be absolutely determined, is, without doubt, much less than in exudative cases; and it is best, even in the last-mentioned cases, not to form too favorable an opinion of its remedial power. Partly by reason of my own experience, partly and preponderantly by reason of specially trustworthy information derived from others; I venture to say most explicitly that the prognosis in the massage-treatment of such displacements, so far as a literally complete restitution is concerned, is tolerably unfavorable. In most cases we must content ourselves with a relative cure, which, indeed, by itself alone, is of great value to the patient. As I have had the opportunity of doing myself, after working for weeks and months, even in severe cases of deviation and fixation of the uterus backward, as, for instance, after a posterior parametritis; one may overcome the fixation, whereby rectal trouble and other symptoms became diminished or completely removed. Moreover, it is easy to restore the uterus to its normal position of anteflexion, for the time being; but to bring it about that it shall continuously and spontaneously remain in that position is quite another matter, and assuredly is an event of extremely rare occurrence. When it is necessary to retain the uterus in its normal position we must usually have recourse to the help of pessaries.

The two technical problems in these cases are, as is readily obvious: to remove residues of inflammation by means of frictions; and by means of repeated repositions, redressions, liftings, and stretchings of different kinds, to lengthen the shortened and shrunken parts. These manipulations, which, *per se*, do not have a place under massage, are performed in the manner customary among gynæcologists—most frequently bimanually, in that one works upon the uterus simultaneously by two avenues, through the vagina and through the rectum or upon the abdominal wall.

Brandt, who is infinitely skillful, is frequently able, in an instant, as it were, to replace a retroverted uterus if it be movable. Where others would need to use both hands, he simply introduces the forefinger of one hand into the vagina, and, having first carried the fundus upward and forward, quickly pushes the *portio* backward and upward. In other cases of retroflexion where reposition is difficult, it frequently happens that he acts upon the uterus, as do other gynæcologists, through all three avenues at once. He carries the *portio* backward by means of the left thumb in the vagina, the forefinger of the left hand being used at the same time in the rectum to carry the fundus backward, while the latter procedure is aided by the right hand placed upon the outside of the abdomen. The patient, according to the nature of the case and the difficulties which it presents, must assume the usual supine position; at other times stand; and at other times take the knee and elbow position on the couch. When the uterus is fixed, we always seek to make it gradually free by exerting gentle force acting in the opposite direction. Looking at Brandt's work, as a whole, gives one the impression that he has also developed this part of the treatment much further than have most of the gynæcologists, both by his unremitting use of the manipulations and through his use of them in many forms. I would call especial attention to the fact that the "lifting" of the uterus made use of by Brandt in prolapsus, a detailed description of which is given below, may also be employed to advantage in other forms of displacement, especially in deviation backwards, in order to stretch the shrunken adnexa, whose shortening is very frequently the cause of the malposition. All of those manipulations that aim at stretching the parts shrunken through inflammation belong preferably to the

later stage of treatment, when the frictions have partly accomplished their purpose. To stretch parts which are still strongly infiltrated or contain considerable masses of exudation cannot yield any satisfactory result. Furthermore, it is necessary to hold fast to the idea that all stretchings must take place gradually, and that, where the purpose of rectifying malposition can be rapidly realized only by the use of considerable force, it must suffice to approximate that end step by step. What has been set forth above as to the manipulations which are appropriate here, though not belonging to massage, will suffice, I think, without further arbitrary classification of them, to afford the reader a summary view of manipulations that vary infinitely according to the nature of the case. Considered singly, they are easy and are self-suggestive as soon as one has clear insight into all the details of the case, which achievement for a non-specialist is frequently difficult enough.

Retroflexio uteri et residua parametritis dextræ et sinistræ.—(Somewhat condensed from Brandt-Schultze-Profanter.)—Franziska B., 29 years old, the wife of a dyer, in Apolda, was received October 31, 1886. Since the beginning of her eight years of sterile married life the patient, from time to time, at intervals of two or three months, has had recurrent attacks of pain, in both sides, which compelled her to pass several days in bed, and were followed by great weakness, nausea, or eructations. In April, 1886, the patient had inflammation of the cæcum. Her bowels are inactive, and appetite bad; she has dyspeptic symptoms; micturition is attended with pain and sensations of burning. Five weeks ago the patient had two fainting fits.

The patient, who is a thin, lightly-built woman, was examined November 5, 1886, during narcosis. The uterus was found to be retroflected. It could be easily reposited, but showed a tendency to return immediately to its former position. The right ovary is small, the left somewhat large; both are movable. The broad ligament and the fold of Douglas, on the right side, are markedly thickened. On the left, a strand of cicatricial tissue passes from the fornix in the direction of the spinous process of the ischium.

The patient was at first treated by rest in bed, aloetic pills, poultices, and pessaries. Massage-treatment began November 18. The condition is now what it was at the last examination, with thick residues upon the right and left sides, and pain upon reposition, with some effusion, constipation and dyspepsia, pain in the bladder, and symptoms of anæmia and faintness, cold feet, etc. Bimanual examination is very painful, by reason of the presence of rheumatic infiltrations, in the abdominal muscles.

Treatment consisted of daily bimanual repositions of the uterus, of uterus lifting, and massage of the residues. The rheumatic infiltrations of the abdominal muscles were massaged at the same time.

December 3.—The uterus lies in a position of anteflexion, without previously undergoing reposition.

December 5.—Yesterday and to-day the position is the same as on the third.

December 9.—Menstruation set in three days ago and the uterus returned to its

position of retroflexion; when the bleeding ceased the uterus spontaneously resumed the position of anteflexion.

December 15.—The uterus, which has been retroflected since the tenth, is to-day spontaneously anteflected.

December 18.—Retroflection again yesterday and to-day.

December 21.—Since the nineteenth the uterus has been spontaneously replaced in the anteflexion position. The right parametrium is completely free from residues; on the left side the strand above mentioned may be felt slightly. Its position is shown in the drawing.

December 22.—The patient, who feels well, decides to depart. She has no pain and no tenderness either in the abdominal walls or elsewhere; constipation is gone; her appetite and sleep are better; and the sensation of cold in her feet has disappeared. On the other hand, the uterus is in retroflexion, without giving rise, however, to any trouble.

As regards the removal of residues and the resulting disappearance of subjective symptoms, this is a typical case, as it is also in respect to the relatively slight influence of the treatment upon the displacement.

In changes of position, where a complete restitution is not obtained, recourse is chiefly to be had, after massage and stretching, to an adjuvant treatment by means of pessaries. So much concerning displacements as such. The residues from inflammation that are frequently present are treated also, as has been mentioned, by means of hydro-therapy by some physicians, while others employ electro-therapy. The latter form of treatment has been strongly recommended by Professor Engelmann, of St. Louis, U. S. A.

Extravasations in the lower pelvis behave in quite the same way under massage as exudations; and massage is now considerably employed in *Hæmatocele retrouterina*. As a whole the same rules hold good for the treatment of the former as for the latter. It is also of importance not to begin too soon with massage in cases of extravasation, otherwise fresh hemorrhage may be occasioned by means of the massage. Otherwise, there is nothing to add to what has been said already.

I introduce the following cases of Prochownick's, but will remark that although I am comparatively inexperienced in these matters, in comparison with Prochownick, I would have postponed massage for a while longer.

1. Mrs. R., twenty-six years old, wife of a tailor in Hamburg, a small, delicate woman, has been married six years and a half. In the first year after marriage she had a living boy that was easily delivered. She then had no children for five years. Menstruated last at the beginning of July, 1882; then no flow till the middle of September following; had nausea and distended breasts. In the middle of September, violent pains came on suddenly in the trunk and sacral region; then straining at times in the bladder and rectum, and rapid loss of power and fainting fits; then three and a half months of hospital treatment for "internal bleeding in the abdomen" (probably tubal pregnancy with rupture). Then slow improvement, with regular but protracted menstrual periods, until a week before the examination of the patient. After raising a wash tub, severe pains came on suddenly, with sense of pressure in the rectum, dysuria, giddiness, and faintness. When examination was made, June 15, 1883, a mass of

effused blood as big as a man's head was found in the pelvis and the right side of the pelvis, when the still bleeding, enlarged, but empty uterus was drawn toward the left. No fever. After the violent symptoms had abated, the tumor remained equally large, thick, and doughy. Operative interference was negatived. From the end of July on, massage was employed, together with injections of ergotin every three days, on account of continued but moderate bleeding. Slight increase of bodily temperature followed (38.4° C. in rectum), on account of which the treatment was put off for a fortnight. Then massage was given every other day; after a while only twice a week. The cure, with nearly complete resorption of the extravasation, required forty sittings in the course of four months. When the massage was stopped, because of a new pregnancy, a small residue of the extravasation remained. Later the patient was well.

2. Mrs. R., thirty-two years old, wife of a laborer in Hamburg, a strongly built woman, the mother of four children. She had been treated from the beginning of January, 1884, at the Polyclinic, having four weeks before fallen ill, with characteristic symptoms of hæmatocele, after violent exertions during the menstrual period. On examination, during narcosis, a left-sided periuterine hæmatocele, about as large as a small fist, presented itself, as well as a retroflexion with adhesion of the uterus, which is now displaced toward the right. This condition is probably of long standing. After two months of fruitless use of vaginal douches, iodine penciling, and sitz-baths; massage was undertaken, but only twice a week,* wherefore the treatment for the removal of the hæmatocele lasted four months. At the end of that time the uterus, the patient being anæsthetized, was freed from its adhesions. A fortnight later massage was resumed and continued for two months, in order to retain the uterus in its improved position, and a Thomas pessary was also made use of. The pessary was carried for a considerable time. It was then withdrawn, and the uterus lay normally anteflected. For the space of three years nothing more was seen of the patient, till she returned in the beginning of September, 1887. This time she had a right-sided tumor in the pelvis, on account of which she had just lain three months in a hospital. It was not possible to make with certainty a differential diagnosis between parametritis and hæmatocele. Still, the latter seemed to be more probable, judging from the course of the disease and by the objective symptoms. There presented itself a right-sided, somewhat elastic, hard tumor about the size of a child's head, with slightly movable walls, which were connected with the tissue behind the fornix without dragging down the latter, but pressed the uterus, the bladder, and the peritoneum considerably to the left and upward. The uterus was easily permeable and slightly hæmorrhagic. There was no fever, but there was still very violent pain. Massage was begun at once, inasmuch as the acute stage had passed and the patient much preferred this treatment to an operation. After thirteen days of daily massage, the patient was able to leave her bed; after twenty-one days she got up. The treatment was continued for a time and restitution was quickly obtained, in so far as the uterus again assumed the position of retroflexion. This condition still continues without a pessary being required; otherwise the woman is sound and does her work.

Chronic metritis has been treated by many physicians by means of massage, and a considerable number of communications in regard to it are to be found in the literature of the subject.

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* I omit all account of what Prochownick calls "passive massage" with "Dehnkugeln," elastic balls (?).

The most important are those by Asp, Brandt, Reeves Jackson, Norström, and Prochownick. If we consider them critically and in addition take account of the oral reports of Swedish gynæcologists, who are more experienced in such matters than any other, we reach a conclusion which may be summarily stated as follows: massage affords results in chronic metritis that may be characterized as tolerably satisfactory, especially when we take into consideration the extraordinary obstinacy of the processes in question, and when we compare it without other remedial measures.

Subjective symptoms, such as pain and dragging sensations, which are frequently very prominent in chronic metritis, not infrequently give way rather quickly. So, too, dysmenorrhœa and bladder and rectal symptoms diminish in their intensity, and the occasionally recurring bleeding stops. In a great number of cases, but always after a long course of treatment, a diminution in the size of the swollen uterus and return to its normal volume has been determined, both through palpation and by means of the sound. Brandt, himself, says, on the contrary, that he has scarcely ever been able to restore an indurated uterus to its fully normal consistence.

Sterility, which is a frequent attendant circumstance, is sometimes removed, and women who, during many years of married life, have not conceived or have aborted, have normal confinements after this treatment.

Displacements, which often accompany chronic metritis, and which now and then must be considered as results of it, afford relatively the worst prognosis.*

Chronic endometritis, which usually occurs in combination with chronic metritis, not seldom becomes cured under massage, and the mucous membrane, even when there are marked "fungous" changes in it, returns to its normal condition. In his report of a case of chronic metritis, with retroflexion and *descensus uteri*, together with severe chronic endometritis, that

* Even Norström, who is evidently inclined to view the matter in a hopeful light, admits that as a rule the position of the uterus after the close of his massage-treatment was, or soon became, the same that obtained before treatment; and adduces this circumstance, in connection with the simultaneous definitive disappearance of the chronic metritis and its symptoms, as a proof of the slight significance of displacements *per se*, which, as we know, are also considered by many modern gynæcologists to have no special importance.

was treated by Brandt, under Schultze's supervision, Profanter makes the remark (*loc. cit*, p. 88) that before one begins the use of massage in chronic metritis the accompanying chronic endometritis must be disposed of by the treatment usual in such cases. This is quite incorrect, since there are many observations, some of which at least may be relied upon, that make for the healing effect of massage upon chronic endometritis; which, moreover, does not appear improbable when we take into consideration its influence upon other chronic catarrhs of the mucous membranes. It is an important consideration that chronic endometritis does not constitute a contraindication against massage, although very many cases of chronic metritis must be excluded from this treatment. Nothing stands in the way of employing various local and general measures in connection with massage. From certain statistical elucidations set forth below, it would seem that the massage-treatment of simple endometritis also yields tolerably good results.

Along with chronic metritis we also class *incomplete or disordered involution of the uterus* after childbed. While mentioning the report that this condition has also been successfully treated with massage by various persons; I will not omit to mention the opinion expressed by Prochownick in his recently published work, which opinion, as it seems to me, is tolerably difficult to gainsay. He agrees that good and tolerably quick results may be obtained by massage in these affections; but since, he has obtained like good results by means of other treatment, consisting of syringing out the vagina with injections of gradually increasing pressure and temperature, half-baths, glycerine-tampons, iron, quinine, hydrastis canadensis, and subcutaneous injections of ergotine, he considers it demonstrably rational to make no use whatever of massage when there is subinvolution, as the treatment is difficult and disagreeable for one and all, and may prove prejudicial to a nursing patient. It seems clear to me that in these cases, where other forms of treatment, on account of their unsatisfactory results, do not demand the assistance of massage, we had better omit the latter.

The appropriate technique in the treatment of chronic metritis is of the bimanual sort, described above, with the left forefinger in the vagina as a support for the uterus, while the middle three

fingers of the right hand make massage through the wall of the abdomen.

It is especially necessary, however, in cases of chronic metritis to bear in mind all possible ætiological factors that may be pertinent, as well as to endeavor to remove their causes. This is particularly the case with regard to one or another form of sexual stimulation, which is not unusual in this affection.

Together with massage, it will be exceedingly advantageous, also, to employ various hydro-therapeutic measures, the usual mineral waters for regulating the bowels, etc., and general hygienic measures, gymnastics, etc., in addition.

Asp furnishes the following table of the results of his treatment of chronic metritis, obtained by means of uterus-massage and general gymnastics :—

Cases of Chronic Metritis.	Married or Unmarried.	Discharged as			Sum.	Mean Length of Treatment in Weeks for :		
		Cured.	Improved.	Uncured.		Cured.	Improved	Uncured.
Without complications, . .	Unmarried,	5	4	1	10	8.6	6.5	. .
	Married,	2	4	4	10	8	6.3	4
With complications, . . .	Unmarried,	1	3	. .	4	. .	8	. .
	Married,	7	2	2	11	15.4	9	7.5
Total, ...	. . . . .	15	13	7	35	. .	. .	. .

Asp gives no account of the course of the endometritis in his various cases. In one case, after sixteen weeks of treatment, endometritis as well as the other symptoms of disease had disappeared; it soon returned, but there was no trace of it in a year after treatment. On the other hand, he mentions seven cases of endometritis (only one of which was combined with chronic metritis), of which four were cured after a massage-treatment which lasted 9.3 weeks on the average; two were improved at the end of five and sixteen weeks respectively; the seventh case broke off treatment at the end of four weeks.

Norström seems to know of none but good and brilliant results from the massage-treatment of chronic metritis; excepting the coincident displacements involved. Under the head of sterility that frequently exists in such cases, he makes particular mention of 22 cases in which, for more than three years, conception "seemed to be impossible;" of these, two conceived during the time of treatment, two immediately after its cessation, and 12 somewhat later still. Asp, also, had one such case.

Prochownick treated (1883–87) 40 cases of uncomplicated chronic metritis. He unfortunately subjected only seven of them to massage-treatment. However, he obtained right good results within the short period of 3–4 weeks. At the same time only four of the patients were permanently cured; and Prochownick attributes their cure not simply to massage, but also to simultaneous hydro-therapeutic measures

and to psychical treatment for the purpose of removing the cause of the chronic metritis, namely masturbation.

Prolapsus (seu Descensus) uteri et vaginæ.—In order to understand rightly the modern treatment of prolapsus devised by Brandt,* in which, in comparison with other manipulations and a peculiar form of local gymnastics, the proper massage manipulations constitute the less essential part; it is proper to call to mind the manifold changes which, with greater or less significance for each particular case, may lie at the basis of the anomaly under consideration.

In order to obtain a reasonably correct idea of the ætiology of these cases, it is, first of all, necessary that we should not go too far in the line of the old, defective conception of the uterus as a suspended organ, held in place chiefly, or almost exclusively, by the broad, sacro-uterine, and round ligaments. A glance at a dissected normal pelvis suffices to show that the adnexa, even in virgins, and in multiparæ to a still higher degree, allow a not inconsiderable sinking of the uterus. Nor should we look on changes in these parts or their stretching as factors that constitute the principal cause of the transposition downward of the uterus, although displacements cannot take place to a high degree without involving a stretching of the ligaments mentioned.

Furthermore, in our present consideration we should not forget or overrate other factors which, without doubt, play their part in the descent of the uterus. They are: 1. increased abdominal pressure occasioned suddenly and purely incidentally in violent exertion, or oft-recurring in severe daily bodily-labor, or chronic constipation; 2. increased weight of the uterus as in fibroids, or in chronic metritis. The position of the uterus, in relation to the vagina, is also of importance. An increase of

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* It is a most interesting fact that Brandt's prolapsus-treatment which, taken as a whole, is rational, inasmuch as it is directed against tolerably complicated disturbances which cause or accompany the abnormal condition, and because it rests upon sound physiological principles, should be wrought out by a layman; and that no medically trained specialist stumbled upon the thought of employing this simple means, which, leaving operative interference out of account, has shown itself more efficacious than all others. We may be tempted to believe that deficient insight into the difficulty of the task favored the hardy undertaking of this therapeutical experiment. Skepticism, that works mischief in certain cases, is a fault often inherent in physicians, but it is scarcely ever found among gymnasts. At the beginning of his activity, Brandt had a large amount of material at his disposal in the Swedish working class, among whom prolapsus was much more general than it is now, the institution of rural midwives having undergone an improvement as necessary as it has been thorough.

the acute angle in physiological anteflexion, or an abolition of the same, so that the long axis of the vagina and the uterus coincide, obviously increases the possibility of a descent of the uterus, especially when such a position for one or another reason becomes permanent. This position, as we know, may accidentally arise by reason of an overfull urinary bladder.

To the ætiological factors just set forth others should be added, which have been recognized, only in recent years, as possessing the great importance that is really theirs. First of all, we should remember, in this connection, the view that has been set forth by authorities of the first class, that in most cases of prolapsus the sinking of the vagina is the primary event, and occasions both the prolongation and the prolapsus of the uterus. In prolapsus vaginæ, incomplete involution after confinement, together with the accompanying stretching and relaxation both of the vagina and the perivaginal connective tissue, naturally plays a very prominent part. Added to these, as contributory circumstances especially worthy of attention, are disturbances in the resistance of the floor of the pelvis to the descent of the genital organs, due to rupture during parturition: and, furthermore, important changes in the muscles concerned may occur through senility or through the degenerative conditions that follow various severe constitutional diseases. In order to make clear the extreme importance that such changes have for our present theme; I will simply allude briefly to the anatomical facts that most closely relate to it, and, for the rest, take for granted the reader's knowledge of the appertaining muscles and fasciæ as they are described in the handbooks. If need be, the reader may easily refresh his memory as to details by consulting such handbooks or appropriate plates, or, better still, by visiting a dissecting-room. It will be well to recall the fact that the median fibres of the funnel-shaped levator ani, which pass in a sagittal direction, being covered both above and below by the pelvic fascia, encompass rectum and vagina on both sides; that the muscle gives off fasciculi to the space between the two, which is chiefly filled with connective tissue, and in this wise surrounds the vagina, high up near the *portio* on three sides, and helps to fix the same in its position as well as to elongate it under certain conditions. According to Ziegenspeck, it also helps to render prolapsus difficult, especially when the uterus has not a

retroverted, that is to say, flexed position, in that it draws the upper part of the vagina forward and somewhat upward, so that this part comes to occupy a horizontal position, and thereby affords a better support to the *portio*. At a deeper level than the levator ani—at the anterior part of the aperture of the pelvis, covered upon the upper side by a layer of the pelvic fascia and on the under side by the fascia propria of the perinæum—we have the deep, transverse muscle of the perinæum (Henle) or the urethro-genital diaphragm of Henle, which affords a passage to the vagina and urethra and, furthermore, influences their ability to offer resistance to an expanding force. And finally, we should, in this connection, remember that part of the 8-shaped collection of muscular fibres whose hinder loop forms the external sphincter ani and whose anterior loop is known by the name of *constrictor cunni*.

Bearing the above-mentioned facts in mind, we may pass now to the detailed description of Brandt's course of procedure. He begins the sitting as follows: while the patient stands bending forward, with her outstretched hands against the wall for support, he gives light tapotement over the sacrum, with the flat of his hand or with his fist; the purpose of this being to stimulate the appropriate nerve-centres. Then the patient lies down upon a bench or couch, in the position already described, with raised head, raised pelvis, flexed and abducted legs, and feet close together. At the same time Brandt seats himself at her left side, in the manner already described. Then the prolapsed uterus, together with the accompanying cystocele and (eventual) proctocele, is restored to its position in the usual manner, so far as it can be brought into its normal anteflected position. When this cannot be done, reposition has to be brought about by means of the mechanical procedure described elsewhere in this chapter, a task that can, sometimes, delay the further treatment. If the reposition of the uterus is successfully performed, then begins the "double treatment," so-called by Brandt, which procedure requires a female assistant.* The assistant kneels upon the couch between the knees of the patient, and then lifts the uterus and its adnexa in such manner that, as she, the assistant, bends over the patient,

* Brandt always employs a female gymnast for this purpose, contrary to what some authors allege. It is only when physicians happen to visit him that they, in case they desire it, undertake the lifting, for the sake of practice.

she seeks to press in between the uterus and the os pubis with the middle three fingers of her supinated hands (which are open and touch each other along their ulnar sides), at the same time making tolerably vigorous pressure upon the abdominal wall. If she succeeds in so doing, and in simultaneously grasping the uterus, the open hands continue to glide over the abdominal wall,* while she draws the uterus in the direction of the abdominal cavity as far as it will go without occasioning severe pain, and with the employment of moderate force, that is to say, much higher than its normal position. At the same time, Brandt's left forefinger, in the vagina, accompanies the movement of the *portio* so far as possible and directs it towards the back of the patient. When the lifting has carried the *portio* out of the reach of the forefinger, the latter remains as high as possible in the vagina and receives the *portio* when it descends and again directs it backward. This "double treatment" is repeated three or four times at a sitting. During each lifting the normal anteflected position of the uterus is controlled in the manner mentioned above. As has already been said, one never lifts a retroflected or retroverted uterus. When these liftings, raisings, or whatever you choose to call them, are concluded, the so-called "double treatment," and with it the necessity of an assistant, is at an end. Brandt, who remains sitting in his former position, then makes rubbings, of small excursion, with the middle fingers of his right hand, at the appropriate place upon the inward-pressed abdominal wall; his purpose being to stimulate thereby the hypogastric-plexus and the posterior portion of the sacro-uterine ligaments of both sides. If the uterus is swollen or if residues of inflammation exist, then kneading, which is performed in the usual manner, is undertaken. Brandt then makes small "nerve-frictions" with the fingers of the right hand, against the supporting finger of the left hand, upon the labia majora, in order to stimulate the inferior pudendal nerves; if a vaginal prolapsus is present. When the wall of the vagina is relaxed, it is treated in the same way by means of small, limited, and tolerably vigorous frictions. When Brandt has finished this procedure, the patient by her own exertion raises her buttocks and the lower part of the back from the couch, so that she only touches the latter

* No sort of massage ointment is here employed in order to make easier the gliding of the hand over the abdominal wall.

with her neck, the upper portion of her back and her feet. In this position for a time she executes concentric and eccentric adduction-resisted-movements with Brandt's help. These are thus performed: the patient holds her knees together and Brandt separates them while the patient makes resistance thereto; thereupon the patient brings her knees together again while Brandt makes resistance to the action.* Brandt's purpose in this procedure is to strengthen the levator ani of the patient (see below). When this procedure has been repeated several times, Brandt again introduces his left forefinger into the vagina, carries the *portio* backward, if it is not already in that position, and, while he holds the same in position, helps the patient with his right hand to rise from the couch; not till then does he withdraw his left finger, with which he has up to this time controlled and fixed the position of the uterus, as otherwise that organ might easily fall back, through the influence of abdominal pressure, as soon as the patient stood up. Finally, Brandt closes the sitting in the same manner as he began it, viz., with a light tapotement of the back. After this the patient must frequently remain for a time in a prone position upon a sofa.

There remains still to be mentioned another important factor of the treatment. The patient is charged on rising in the morning, on going to bed, as well as several times during the course of the day, to give direct exercise to the muscles on the floor of the pelvis so as to bring the levator ani and external sphincter into action, just as one would do who should strive to prevent the exit of wind or fæces from the rectum. The position to be taken is that described under the gymnastics of the adductors when the knees are vigorously held close together.

In addition to the mechanical treatment Brandt makes use of no other means than injections of water, of an ordinary temperature, which the patient herself has to perform. Nevertheless, a more thorough-going hydro-therapeutic and electrical treatment may be simultaneously resorted to with advantage. In perineal rupture restitution by surgical means should precede the Brandt-treatment. In case of marked hypertrophy of the cervix an amputation of the same must first take place. Generally in severe cases (above all in senile inveterate cases), a careful weighing of the prognostic factors must

* The adductors are the active muscles in both cases, and I, therefore, call the movement involved in separating the knees, an eccentric adduction-resisted-movement, in spite of the fact that it is an abduction as respects its direction. This seems to me the only way to attain lucidity of expression in the use of the terms concentric and eccentric movements, which must be referred to the muscle groups that are called into action (see p. 75).

determine whether it is better to attempt a cure by means of Brandt's treatment before one has recourse to operative interference.

If we now take a short survey of the Brandt-treatment, we shall find that the method corresponds more or less completely, in all its details, to definite therapeutic purposes based upon the pathological anatomy of prolapsus. A portion of the manipulations is, however, of slight or undetermined significance. In particular, it may be just as imprudent to attribute much importance to tapotement of the sacrum or to "nerve-frictions" over the hypogastric plexus, as to deny them any worth whatever. The "nerve-frictions" along the course of the inferior-pudendal nerves may certainly be omitted without notably prejudicing the result.* Those frictions that aim at mechanical stimulation of the lower portions of the sacro-uterine ligaments can attain their end only in very few cases, where the abdominal wall is especially relaxed. Aside from the reposition, over whose sun-clear value I will not tarry here, the first important factor that we find in the treatment is the uterus-liftings. These would exert a contrary influence upon all the mechanical conditions depending upon the prolapsus. Perhaps it is doubtful whether they always, or indeed frequently, fulfill Brandt's purpose of bringing about contraction through the sudden stretching of the adnexa which contain muscular elements, since the indirect fixing of the uterus on the floor of the pelvis in many cases acts as a hindrance to the further lifting —sooner, probably, than do the adnexa named. On the other hand a very slight degree of lifting of the uterus above its normal level must have the effect of stretching inflammatory adhesions, which so often lie at the basis of displacements; particularly backward deviations which, without any stretching, allow of a slight raising of the uterus (Ziegenspeck). In this way the liftings doubtless serve to facilitate the return of the uterus to its normal anteflected position. This circumstance is of importance also in preventing a return of the prolapsus, which, by reason of the position of the vagina may more readily occur in backward

* The irritation of these nerves has been censured on the ground that the clitoris being innervated, as we know, by an upper branch of the same nerve-trunk, such an excitation may readily assume a sexual character. To this Brandt replies that no danger of this kind can occur when the frictions are made so vigorously as to give rise to pain. Nevertheless, as has been said, we had better dispense with it; even if we do not allow ourselves to be too much intimidated by a current phrase which intimates that a stimulation which causes pain does not exclude sensuous pleasure.

deviations. The resistive gymnastics, which are made by the help of the adductors, as has been mentioned, are intended, according to Brandt, to strengthen the muscles of the diaphragm of the pelvis, especially the levator ani. Others also have offered the same explanation of their action in this connection.* Nevertheless, a very slight investigation, just because of the effects of the levator ani upon the position of the anus, shows: 1. that these muscles, and very probably also the rest of the musculature of the floor of the pelvis, are called into action to an extremely insignificant or even scarcely noticeable degree, even in vigorous resisted-adduction of the thighs; 2. that, on the contrary, this last takes place with incomparably more force from innervating the external-sphincter, as when we hold back the crowding contents of the rectum. Hence, I believe that that part of gymnastics made use of by Brandt in prolapsus (in which the patient has to exercise the muscles of the floor of the pelvis in the manner last mentioned) is infinitely more essential to the strengthening of those muscles than the resisted-adduction, which does not strengthen other muscles than just the adductors themselves, in any degree that is worth mentioning. However, future investigations, which in all probability will soon be undertaken on an extensive scale by German specialists, must give more certain information as to the meaning of the adduction-gymnastics. The importance of uterus-massage for the cure of prolapsus in chronic metritis, through the diminution of the weight of the uterus, is perfectly obvious.

Every one who has himself performed the Brandt-treatment of prolapsus, or who critically considers the results obtained by its use on the part of others, must recognize that the treatment exerts an astonishingly powerful influence.† The most important elements in prognosis are the degree of the prolapsus, together with the age of the same and that of the patient. That in pro-

* F. Von Preuschen (Centralblatt für Gynaekologie, 1888, No. 13, p. 3) believes that, on careful exploration he has surely determined that the muscles in the diaphragm of the pelvis (especially the *levatores ani*) contract in the resisted-adduction-movements—especially when the patient raises her buttocks—and ascribes to this circumstance much too great a significance, as I think, for the reasons set forth above.

† Astonishing, namely, to those who are not given over to the uncritical enthusiasm for mechano-therapy, which passes all reasonable limits in describing its ability. Those who are not transported by this enthusiasm are not likely to entertain any great hope of cure by means of any non-operative measure whatever, in a case of prolapsus that is at all well developed.

nounced, inveterate cases of prolapsus in senile individuals the Brandt-treatment must frequently prove partially or wholly abortive, like all other non-operative procedures, is self evident and hardly needs to be specially mentioned. On the contrary, it is necessary to emphasize the fact, which is quite as astonishing as it is fully determined, that the treatment, in many instances, is able to bring about a permanent cure in cases that are only moderately favorable; that this happenseven in cases of total prolapsus, which have remained unchanged during more than a score of years; and that, also in cases where this does not result, the treatment is generally accompanied by such genuine improvement that the uterus may thereafter be easily retained in its normal position by means of pessaries or tampons, or at least prevented from again prolapsing. When we remember our former performances in cases of prolapsus, leaving operative interference out of account, we must admit that the Brandt-treatment is a very great step forward.

Case treated by Brandt, controlled by Schultze, reported by Profanter; somewhat condensed.

Louise Sch., thirty-four years old, a farmer's wife, from Cospeda, was received for treatment at Schultze's Clinic (in Jena) December 29, 1886. Except for the usual diseases of childhood the patient had always been healthy; was married in 1875, and had her first confinement in the course of that year. The patient left her bed two days after her confinement. At about the middle of her first pregnancy *descensus uteri* took place from excess of bodily exercise (turning the crank of a threshing machine). This condition continued to grow worse till her second child was born, in 1877. In spite of the prolapsus, the patient got up a week after second confinement and went to work again. After her third pregnancy, she lay in bed nine weeks at home, and then five weeks in the surgical clinic, because of some trouble with her foot. The prolapsus grew worse again when the patient resumed hard work, and since 1879, from lifting a heavy basket, has remained total. In 1884 she consulted a midwife, who replaced the uterus and introduced a pessary that was retained for six weeks, when prolapsus of the uterus occurred again.

The patient, who is small, but healthy, complained of heaviness and dragging in the abdomen, and of urgent and painful urination. There are, besides, severe pains throughout the abdomen that exacerbate when she menstruates. She has a moderate amount of effusion; also cold feet.

On examination, during narcosis, the uterus is found lying backward and to the left; the vagina has prolapsed so far that the transition fold is visible. There is an inversion-angle about 2 centimeters above the orifice of the urethra. The sound passes 6 centimeters in the direction of the *os uteri;* upward and backward, to the right, 10 centimeters; and upward and backward 8.5 centimeters to the left. During the sounding the bladder emptied itself of about 1 cubic centimeter of urine. No rectocele is present. Reposition of the uterus, high up in the pelvis, in anteflexion is easily effected. The *os uteri* is rather wide, lacerated, ectropic, its anterior lip ulcer-

ated. In the anteflected position the sound meets resistance at a distance of 8 centimeters. In the prolapsed condition of the uterus, the tip of the sound may be felt in the fundus (14 centimeters up) by palpation through the abdomen and through the rectum.

Brandt's treatment began on December 30. The patient rests fifteen minutes after the sitting; at other times is allowed to go about, but for the present is forbidden to climb stairs. After the first lifting, the uterus remains fixed by the perceptible tension of the left fold of Douglas, with the *portio vaginalis* 5 centimeters above the posterior commissure of the labiæ. The uterus itself lies retroverted and drawn toward the left.

January 1, 1887. Uterus is 0.5 centimeter higher than yesterday, perhaps; the hypertrophy of the cervix has abated.

January 2. The uterus is nearer the median line, no longer retroverted.

January 11. Uterus is exactly in the median line, and somewhat anteflected.

January 14. *Corpus uteri* markedly smaller. The hypertrophy has still further abated. Ectropion is nearly gone. The patient, on her own responsibility, took an hour's walk outside the clinic.

January 15. Uterus is 1 centimeter lower than yesterday (effect of walking), and is somewhat retroverted. Everything as formerly after the sitting.

January 19. Patient walked for a quarter of an hour about the town. The uterus suffers no change therefrom.

January 20. Position of uterus normal. The patient now walks a while every day, for thirty to sixty minutes, without producing any change in the position of the uterus.

January 27. The *cervix uteri* to-day is somewhat further back, fixed by the folds of Douglas. The tip of the lacerated *portio vaginalis* is situated on a level with the spine of the ischium, rather above than below it. The anterior vaginal wall is no longer so relaxed as on January 20.

January 31. The patient is discharged. The uterus is in its normal position. *Cavum uteri* measures nine centimeters. The patient feels entirely well; all symptoms of prolapse have disappeared.

Brandt treats purely nervous cramp of the bladder, be it in the detrusor, in enuresis spastica, or in the sphincter, in dysuria spastica, by means of derivative movements and massage of the arms, and preferably of the legs also, as well as by means of frictions of the organ itself through the vagina.

In obstetrics some manipulations are used which may be counted under massage, *e. g.*, in incomplete contraction of the uterus *post-partum*, and in the bleeding from the placental vessels, depending upon the above condition, when one rubs the organ through the abdominal wall by means of moderately strong frictions, and thereby stimulates it to contract.

B. Diseases of the Male Uro-genital Apparatus.

Very few diseases of the male uro-genital organs have been treated with massage; they are:—

Organic Urethral Strictures.—Geyza Antal has, in connection with the ordinary dilating treatment by means of bougies, employed massage through the perineum in those affections which are so usual after long-continued gonorrhœa. The aim of the treatment is to remove the periurethral submucous infiltration which brings about the stricture. In recent years, I have made use of this *per se* rational treatment, in a small number of cases. One must first of all accurately determine the seat of the stricture, which may easily be done by introducing a large-sized bougie, which remains fixed at the anterior limit of the stricture and whose point, in ordinary cases, may easily be felt through the perineum. After withdrawing the bougie, one makes pretty vigorous frictions of the perineum, at the appropriate spot,* for several minutes. It is easy to instruct the patient to perform this procedure himself, morning and evening. For the sake of avoiding too great mechanical irritation, it should be performed at some other time of day than that when dilation, with increasingly large bougies, is made. I believe that I have discovered that we can facilitate the dilatation a good deal by means of massage.

Chronic Prostatitis and Hypertrophy of the Prostate.—Estlander, of Helsingfors, made a beginning of the massage of this form of affections in 1877. After that Rütte brought about permanent cure by the use of massage, in retention of urine resulting from hypertrophy of the prostate. Estlander is of the opinion that massage is in place in cases of infarct and still more in induration. However, Estlander, in two cases of senile hypertrophy of the prostate, obtained no particular improvement through the use of massage, which was, it must be admit-

* Hünerfauth remarks, in regard to stricture-massage, that one should massage the *pars prostatica* and the *pars membranacea* through the rectum. It is, however, a known fact that strictures may exist anywhere in the urethra except *just in* the *pars prostatica;* though, generally, they are situated, as Sir Henry Thompson and many others teach us, on the anterior border of the *pars membranacea*, just where it passes into the *pars bulbosa*. The anterior border and the entire course of the *pars membranacea* may, however, be massaged particularly well from the perineum. Hence, I cannot see that we are ever obliged to massage strictures from the rectum; and, since we have the choice of doing this either from the rectum or the perineum, it may well be that a "compact majority" will prefer the latter place as the seat of massage.

ted, of tolerably short duration. Massage must be executed in the rectum by means of frictions upon the prostate.

The report of Estlander's first case, much condensed, is as follows :—

I. W., 28 years old, merchant, who has had a small series of attacks of gonorrhœa during the last half dozen years, was never free from effusion from the urethra and has been subjected to various forms of injections. In December, 1876, several months after the last injection, the patient began to feel a severe burning sensation when he finished urinating, which was followed sometimes by a drop of blood; to this was added pain in the anus, when defecating, as well as pain in the ilio-lumbar tract. When the patient, a weakly, anæmic person, was examined on January 23, 1877, these symptoms were observed: some effusion from the urethra; violent pains on introducing the sound, when the instrument passes through the prostate; the latter appears markedly enlarged when palpated; one feels a plainly fluctuating abscess, larger than a pea, on the left lobe, and some smaller inequalities in addition. Leeches to the perineum, opium injection, and Vichy water were prescribed for the patient. The abscess, mentioned above, burst six days later and the pains ceased. Massage treatment was begun; at first in this wise: a Beniqué's sound of high number was introduced into the urethra, and massage was made in the rectum by means of light frictions; later on it seemed more advantageous to give massage without employing the sound. The patient was discharged March 13, when the nodes in the prostate were much smaller than before, and the amount of urine passed was normal.

CHAPTER XIV.

DISEASES OF THE EAR, NOSE, OF THE PHARYNX AND LARYNX, AND OF THE THORACIC ORGANS.

A. Diseases of the Ear, Nose, Pharynx and Larynx.*

The meritorious, quickening, and rational exposition, by Gerst, of throat-massage, or, rather and better, of throat effleurage (see p. 46), has contributed chiefly to a rather limited employment of massage in the affections of those organs whose vascular supply stands in direct relation to the veins of the neck. I have already mentioned (on p. 84) the worth of throat-effleurage for traumata of the head, by reason of its power of quickening the circulation as well as of its accompanying peculiarities (see pp. 51–54), and need not further concern myself here with the exposition of its antiphlogistic, resorptive, and nutritive peculiarities.

In acute inflammatory processes of different kinds in the ears, nose, pharynx, and larynx, effleurage of the throat is the only massage procedure that can be considered appropriate. On the other hand, in the case of chronic inflammation and the thickening, infiltration, hypertrophy, etc., resulting from them, frictions may be employed so far as the pharynx and the neighboring part of the Eustachian tube or the outer ear are concerned.

In acute inflammatory processes, throughout the whole territory in question, throat-effleurage has an antiphlogistic value that cannot be gainsaid, and ought, indeed, to be considered as fully proven by Gerst. So, too, the opinion is wholly justifiable that such treatment repeated several times a day hastens recovery. It is, however, clear to every physician that we cannot entertain great hope from throat-effleurage alone, when we have to do with tuberculous or syphilitic ulcers. In the same way we must reserve our opinion of the value of massage, when there is a question of croupous or of purely diphtheritic processes. For the sake of being objective and thoroughgoing, I have

* I put the massage-treatment of these affections together because, as regards technique and physiology, it contains much that is common to all.

set forth below a trustworthy account of a case which illustrates the effect of throat-effleurage in a case of croup. Still, the most enthusiastic mechano-therapeutist would hardly attribute more than minimal importance to a solitary case of combined treatment where the disease had the nature of croup. We shall only attain a clearer conception as to how far throat-effleurage may serve, in such cases, as a valuable accessory to other remedial measures, when some physician, devoted to the diseases of children, who has an extensive practice (preferably in a hospital), shall have conducted a series of experiments in this field, and brought together, after some time, his experience and his views. That this has not already taken place, in spite of the fact that an impulse has not been lacking for a long time, and in spite of our hitherto unsatisfactory therapy of these diseases, furnishes no very flattering ground for hope.

The importance of frictions in acute affections has been relegated to the background by throat-effleurage; in chronic affections frictions constitute the more effective manipulations. In the great majority of these and other cases massage forms but a part of rational therapeutics. Especial emphasis should be laid upon the fact that throat-effleurage, in almost all cases, and so far forth as transient conditions are not concerned, must be given three or four times a day, in sittings which last about ten minutes.

Diseases of the Ear.—*Othæmatoma* was treated first by massage, in the form of frictions, by W. Meyer, later by Blake and Urbantschitsch.* Both of Meyer's patients were persons of sound mind, though they had hereditary predisposition to psychical disease. In one case the hæmatoma was spontaneous, in the other it appeared to be of traumatic origin. The othæmatomata were double in both cases and presented the ordinary appearance. In one case (where hæmatoma developed upon the right ear and was treated a year and a half later than that upon the left) the growths abated quickly under a compressive bandage and massage, and left an insignificant thickening, together with somewhat diminished transparency and pliability; in the other case, they were reduced to a minimum, but not until the end of three weeks. When othæmatoma occurs in sane persons,

* W. Meyer, in Archiv für Ohrenheilkunde, 1880. Blake, in Zeitschrift für Ohrenheilkunde, Band XIII. Urbantschitsch, Lehrbuch der Ohrenheilkunde, Wien, 1884.

or in such of the insane, for example the demented, who are not excited by the treatment, massage seems to be quite as justifiable a procedure as expectation or poultices, pressure-bandages, penciling, or surgical interference, and may possibly serve as a more efficient preventive of changes in the form of the ear than the other measures I have mentioned.

Nevertheless, Pollitzer declares that one ought to leave small, painless hæmatomata to undergo spontaneous cure; that painful hæmic swellings ought not to be subjected either to pressure-bandages or massage; and that, in other cases, massage should be used only with the greatest caution, and not until three or four weeks after their appearance, as it may easily cause fresh bleeding.*

Zaufal has massaged away thickenings of the outer ear after chronic eczema.

Urbantschitsch prescribes (l. c., p. 89) massage in the form of stroking over the affected parts in circumscribed,† external otitis or furuncle of the outer passage of the ear. He employs massage and tampons alternately.

Otitis externa diffusa has been treated by Gerst by means of throat-effleurage and with good results. The sittings lasted for ten minutes, three times a day.

Otitis media catarrhalis, or catarrh of the tympanic cavity, has been treated, as is well known, by various means which are designed to keep the tube open, to remove the secretion and to modify the catarrh. For this latter purpose we may employ throat-massage, as Gerst has done with success, in acute and

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* Lehrbuch der Ohrenheilkunde, Stuttgart, 1887.

† Various procedures, which are described as ear massage, do not belong to it. When Gruber, after scarifying a furuncle in the outer vestibule of the ear, introduces a tampon into the same, it is no more massage than any other statical pressure made use of for a similar purpose. Eitelberg, in the Wiener Medicinische Presse, pp. 26-31, 1883, has written a whole series of articles "On Massage in Diseases of the Ear." He talks about the influence of the statical pressure from a drainage-tube in circumscribed external otitis; of the dilatation of contractions by means of sponge- and laminaria-tents; and about the pressure on polypus by means of tampons, or upon exostoses by means of ivory rods,—all of which have no place in massage. Then he describes a form of massage, for acute or subacute catarrh in the middle ear, which consists in rubbing the region over the mastoid process, for eight minutes at a time, in the direction of the auricle, with the thumb and forefinger. Whether the improvement of the subjective auditory sensations, sometimes followed by deterioration, which were observed, were due to this form of treatment, which, as it seems to me, was not a particularly hopeful one, no man can determine. Eitelberg once massaged the auricle on account of a neuralgia, without obtaining any result whatever.

chronic cases. During and after chronic processes, frictions may be used in addition, for the sake of modifying thickening of the tube. This can be done in two ways. Either we may apply massage, as did Pollitzer (l. c., p. 229), immediately under the outer ear, between the mastoid process and the ascending portion of the under-jaw,* or, according to Zaufal and Urbantschitsch, upon the tube from the naso-pharyngeal cavity. For the catarrh which usually accompanies this trouble, we may employ local friction as well as throat-effleurage with advantage. (See below.)

In acute cases of *otitis media suppurativa* throat-effleurage is the only form of massage to be considered, as a means of exerting an antiphlogistic effect upon the beginning of the process, as well as to help the healing after the other, customary treatment and the removal of the pus, and to prevent the affection from assuming a chronic form. Even in this last named condition, we are justified in believing that throat-effleurage, repeated several times daily (at lengthy sittings, according to Gerst's recommendation), is of value in promoting recovery.

Massage has been tried in some *neuroses of the ear*. Pollitzer's experience is best worthy of mention here. He says (l. c., pp. 425–426): "I observed, after several days' repeated massage, a notable improvement; yes, even complete disappearance of otalgia in several cases, in which the pain involved the entire neighborhood of the ear and was especially increased by pressure on the region between the ramus of the under-jaw and the mastoid process, which corresponds to the course of the cartilaginous part of the tube." Furthermore, in neuralgia of the external ear one must look for sensibility to pressure on the part of the auriculo-temporal, auricularis-magnus, and lesser occipital nerves.

Diseases of the Nose and Pharynx.†—Gerst has employed effleurage of the throat in *ozæna* and *angina tonsillaris*, and in acute and chronic naso-pharyngeal catarrhs. In chronic catarrh frictions are of value. I saw Dr. Boekmann, of St. Paul, Minne-

* It seems to me that such massage can exert extremely little influence upon the tube, which, at this point, is tolerably well protected.

† For the present I leave wholly undecided the claims as to the influence of throat-effleurage and other forms of massage-treatment upon diphtheritic processes. E. Freund has written an article in the *Prager Medicinische Wochenschrift*, 1881, upon the massage-treatment of croupous and catarrhal laryngitis, and of *angina diphtherica et catarrhalis*, which, however, my bookseller could not procure for me.

sota, use them in a manner new to me. In cases of the very common *pharyngitis chronica granulosa*, he is wont to introduce his index-finger into the naso-pharyngeal cavity, and perform frictions over all its surface, with such force as to crush capillaries and cause a certain amount of bleeding. After this treatment, which is completed at a single sitting, the usual means of treatment are employed, such as medicated douches, inhalations, gargles, etc. Dr. Boekmann was very well satisfied with this form of treatment, which seems to me to be excellent.

In hypertrophy of the tonsils, frictions of moderate force may be used in addition to the usual forms of procedure. I cite the following case here, which I had an opportunity to observe during the course of treatment.

Miss A. B., thirty-six years old, teacher of singing, was scrofulous in her childhood and frequently had catarrh of the throat, and follicular angina. Three years ago the patient had an uncommonly severe angina, and dates therefrom a severe tonsillar-hypertrophy. Since that time she has always been troubled by a copious secretion of mucus, and by a feeling of obstruction and weight in the throat, which interfered with her calling as a teacher of singing. At the end of September, 1889, the whole naso-pharyngeal cavity showed a very loose and œdematous infiltration of the mucous membrane, which was more or less covered with follicular, granulating swellings. The tonsils were much hypertrophied; the larynx was normal. By the end of January, 1890, the patient had had fifty massage-sittings at the hands of a gymnast, Lieut. Tersmeden, in Stockholm, which consisted partly of frictions (vaseline being used on the tonsils and the catarrhal mucous membrane), partly of throat-massage. The condition was so far changed thereby that the subjective symptoms disappeared; the still catarrhal mucous membrane appeared much more normal; and the tonsils seemed to be reduced by more than half of their former size.

Diseases of the Larynx.—Among these affections acute, simple laryngitis is the very form which was treated by Gerst, and later by others, who secured good results with throat-massage. Nevertheless, further investigations are needed before we can form a decided opinion of the value of the treatment. Especially in the form which is called false croup have we the right to expect something from throat-massage.

Bela Weiss' case.* Carl M., five and a half years old, has a cough of two days' standing. On the third day the cough became dry and barking, with the usual distressing attacks; voice was hoarse and he had some fever. When Weiss was called in at night the pulse was 114; the pharynx was intensely reddened; the tonsils were a dull red, somewhat enlarged, uncoated; the cough metallic, respiration short and

* Casuistische Mittheilungen über die Anwendung der Massage bei Laryngitis catarrhalis et crouposa. Archiv für Kinderheilkunde, 1880, Bd. 1, p. 201.

blowing, voice inaudible. Weiss made throat-massage for ten minutes. "The effect was immediately striking," in that the symptoms quickly abated. The next morning the patient's condition, after a good night, was satisfactory, and the symptoms did not return.

In *œdema of the glottis*, throat-massage is worthy to be considered in connection with other measures usually employed for this affection. However, so far as I know, no accounts of cases of this sort have been published.

As to syphilitic, tuberculous, croupous, and diphtheritic processes in the larynx, I think, as has been indicated above, we are not yet warranted in expressing an opinion. Nevertheless, I would call the reader's attention to the case set forth below. It is a case of genuine croup, described by Weiss.

Richard Winkler, six years old, on the night of November 21, 1879, after slight prodromata during the foregoing day, had a slight fever, a pulse of 100, and a suspicious cough. The examination disclosed weak, sibilant râles, a yellowish-white coating of the fauces, which was punctiform on the right tonsil, and showed large patches over the left. After an emetic, and two attacks of vomiting, the patient's condition was somewhat improved; but he grew worse on the following day, and at evening the respiration showed a severe stenosis of the larynx. On the 22d Prof. Wiederhofer was called in. He diagnosed true croup and proposed tracheotomy. Weiss applied throat-massage to the child for seven minutes, and later, as the child lay in bed, gave another sitting of the same sort, which lasted twelve minutes. Thereupon the child showed a looser, better-sounding cough, and expectorated some false membrane, after which the symptoms of stenosis of the larynx became strikingly abated. Chlorate of potassium, which hitherto had been employed, was now discontinued, and steam was continuously made in the bed-chamber. Two hours later the patient was again massaged for ten minutes, after which the patient improved still more, and the child fell asleep. The third massage-sitting, in the evening, was closed with an attack of coughing and the expectoration of false membranes; during the night the attacks of coughing were milder. On the twenty-third the symptoms were still further abated; the child had two massage-sittings, one in the morning and one in the evening; and after five or six days, attended by lighter cough, recovery, was complete.

B. Diseases of the Thoracic Organs.

Cardiac Diseases.*—Certain forms of heart-disease have been treated by means of mechano-therapy, in Sweden, ever since the time of Ling; and during the last few decades this form of treatment has been pursued by various Swedish physicians in a

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* Massage has so little to do with affections of the heart that I should scarcely have mentioned this use of it, unless Professor Oertel's "Massage des Herzens" (München, 1889,) had appeared just before this long-delayed portion of this book was in press. I am, therefore, under the necessity of setting forth my own views of this procedure, which I consider to have very slight practical importance, for reasons that are hinted at below; an exposition of them *in extenso*, would, however, take me too far afield.

particularly careful and rational way. Especial mention should be made of Dr. Zander, who has treated a great number of persons affected by cardiac disease, at his Medico-mechanical Institution in Stockholm.* In by far the greater number of cases recourse has been had to gymnastics, partly by gymnastics of the muscles concerned in respiration, in order to turn to account the powerful influence of deepened and quickened respiration, both upon the pulmonary and the systemic circulation; and partly through other classes of movements and the increased activity of the heart to which they give rise, for the sake of exercising and strengthening the cardiac muscle and to promote compensatory hypertrophy in the same. In this connection massage plays an entirely subordinate part. It has been applied, sometimes, either to the extremities, in order to secure a quickening effect upon local and general circulation and upon nutrition; or in the form of tapotement of various kinds, in order, through the reflex influence of the vagus nerve, to diminish too rapid action of the heart. The last named manipulation constitutes the most important factor in the so-called "heart-massage," which is, on the whole, a procedure of little importance. Tapotement is executed on the anterior part of the thorax with the flat hand, or "*à l'air comprimé*" (that is to say, with the hand held in such a way that one could hold water in it); or vibrations† are made with the clenched fist against the thorax, by which means the pulse-rate may be diminished quite rapidly.

For a much longer time, and long before Oertel had anything to say about such cures, mountain-climbing has been systematically employed in the treatment of cardiac affections at Scandinavian health-resorts.‡ Nevertheless, this form of treatment was never made much of, and attracted no attention outside of Scandinavia, and very little within it. The latter fact is, without doubt, chiefly due to Zander's gymnastic method of treating cardiac affections, which method possesses the advantage of making possible an extremely accurate adaptation and control of the means used in individual cases. In Germany, a great number of physicians had so little regard for the "Swedish medical-gymnastics," that most men would not venture to enter that field, and even the Swedish treatment of heart disease, according to Zander's method; remained pretty much unnoticed in Germany, till Nebel's § very recent work made it known. Nevertheless, the same method of influencing the heart and the respiration through mountain-climbing, which had been in vogue for some time in the Scandinavian North, arose in Germany, so that Oertel came to represent this method, which,

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*Zander, Om Mediko-Mekaniska Institutet i Stockholm, Nord. Med. Archiv, Band IV, N:r 9, 1872. = Concerning the Medico-Mechanical Institute, in Stockholm. Northern Medical Archives, Vol. IV, No. 9, 1872.

†Zander's "Back-vibrations" act in exactly the same way.

‡I would especially emphasize the fact, which I can prove, that this was the case as long ago as the early seventies, at Modum, a much-frequented health-resort, where Dr. Thaulow, Sr., prescribed hill-climbing (usually and particularly for corpulent persons with too weak heart-muscle, and even in cases of valvular troubles), together with a diet containing a limited amount of fat and carbo-hydrates, which is just the course, so far as claims of novelty are concerned, which now goes under the name, though wrongfully, of Oertel's "*Diät und Terrainkur.*" Dr. Thaulow, in his enthusiasm over the results obtained, used to point out a long, high hill which he claimed was of much more value to patients with affections of the heart than any other remedy whatever. Nothing was lacking, excepting the more lately added "interrupted expiration;" the limitation of water consumption, a procedure often of doubtful value; and the newly "discovered" heart-massage, which, in my opinion, is worthless.

§H. Nebel, Beiträge zur mechanischen Behandlung. Wiesbaden, 1888.

in its entirety, includes the limitation of the intake of fat, carbo-hydrates, and water, as well as mountain-climbing. This method is generally known now under the name of Oertel's "Diet and Terrain-Cure." Although such a form of treatment, which, as I have said, was applied before Oertel used it, admits of less accurate adaptation than the Zander-gymnastics to individual cases, still it has a great advantage in that it proceeds in the open air, and that it can be carried out under circumstances which are in general more refreshing to the patient than a visit to a gymnasium.

I must here enter into a full consideration of this matter, since the Oertel heart-massage is, in most cases, only a supplementary factor to the "*terrain-kur*,"—or it ought to be if it is not. In this procedure, as well as in gymnastics and the different forms of tapotement of the thorax, are comprised the mechanical means by which we are able to influence diseased conditions of the heart. It is not necessary to enter here into a detailed consideration of the Oertel treatment. It is, when used with discrimination, of great value; and, like other measures, although to a higher degree than most, has been frightfully misused, as now and then it has laid a too heavy burden of mechanical labor upon a weak heart (not to speak of what seems to me the unhappy influence of decreasing the amount of fluid ingested). Meanwhile, recently, in addition to the mountain-climbing, a particular form of breathing exercise has come into vogue; and this it is which has led to the development of Oertel's so-called "heart-massage," which constitutes only one among many means of re-enforcing the expiration, and *has for its aim* thereby to exert a purely mechanical influence upon the heart-muscle.*

The form of respiration recommended by Oertel in the *terrain-kur*, *i.e.*, in mountain climbing, consists partly in the patient's causing his respiratory movements to keep time with his steps, partly and chiefly in this, that the expiration is prolonged and divided into two phases. The patient's expiration is of the usual kind, but it is immediately followed by a forced expiration of air, which is followed by a spontaneous, deep inspiration. Oertel found that, when this so-called "interrupted breathing" was employed, the usual dyspnœic troubles attendant on cases of insufficient heart-muscle did not appear, or first appeared later; and that the pulse became less frequent, and at the same time stronger and more regular.

In Oertel's heart-massage, just such a method of respiration as that above described is employed; and the massage consists in this, that by means of manipulation of the chest-wall the already forced expiration is still further modified and increased.

The patient is directed to breathe in the above mentioned manner; the masseur then lays his flat hands upon the thorax in the axillary line, over the fifth and sixth ribs on both sides, and, during the expiration (preferably during its last forced stage only), brings them forward as far as the sternal cartilages of the seventh and eighth ribs, and the ensiform process,—at the same time exerting a gradually increasing pressure of the hands against the chest. Just before the completion of this procedure, or during the last part of the expiration, the pressure upon the chest-wall may be still

* If the manipulations which form the heart-massage of Oertel were intended only as a means to obtaining a more complete expiration, it is likely that Oertel would not have called them massage, but would have classed them under the passive movements of gymnastics. Inasmuch as Oertel also intends to act, by means of the varying pressure involved in this manipulation, directly upon the tissue of the heart-muscle, in the same way as in the massage of the skeletal muscles, it is on this account consistent with his standpoint to speak of heart-massage. How far such an influence is really operative, is quite another question, which I shall answer below in the negative.

further augmented if the thumbs of the masseur are laid upon the lower extremity of the sternum and are pressed upon it, or at least prevent it from moving outward, while the other fingers exert a continuous pressure upon the sides of the thorax.

It is necessary, in order to comprehend this procedure as a whole, and to form an opinion whether and to what degree this "original heart-massage" * deserves its name, for us to consider certain physiological facts.

To begin with, we remark, as does Oertel, that the amount of expired air (also in mountain-climbing) in "interrupted-expiration," *ceteris paribus*, is greater than in simple expiration. For instance, a patient with a vital lung-capacity of only 1175 cubic centimeters gave out during a simple expiration 554 c. c., and in re-enforced expiration gave out 736 c. c., on an average. When "heart-massage" was given, the volume of expired air was still further increased. Another patient, with a lung-capacity of 1450 c. c., in an ordinary expiration, unattended by external pressure, gave out 485 c. c.; while under "heart-massage," during the expiration, the figure increased to 642: during interrupted-expiration, without pressure, 671 c. c. were given out; under "heart-massage" the number rose to 991 c. c., etc.

Respiration, as every one knows, has a great influence upon the circulation. We will pass over, for the moment, the weightiest facts for our present consideration, and briefly call to mind (referring our readers to the physiological handbooks for details), that, in the natural act of inspiration, the blood is sucked into the right heart; that the lumen of the pulmonary vessels is increased; that the blood stream to the left heart, which is diminished at the beginning of the inspiration, is increased immediately after it; that the heart-beats increase in number; and that the vessels of the systemic circulation are expanded. During expiration, the lumen of the pulmonary vessels is diminished, wherefore the blood on this account (leaving the *vis a tergo* of the right chamber of the heart out of consideration), is driven out of the lungs to the place where pressure is lowest, *i. e.*, to the left heart. Moreover, during expiration, the passage of the blood through the lungs is rendered more difficult; the pulse-rate, under the influence of the vagus nerves decreases, and the vessels of the systemic circulation narrow themselves. Furthermore, we should remember, as regards aortic blood-pressure—concerning whose character so many factors are involved—that it remains comparatively unchanged in quiet breathing; that when breathing is quicker and deeper it rises during expiration and sinks during inspiration; and that, in deep and slow breathing, the maximum of blood-pressure occurs at the beginning of expiration and its minimum at the beginning of inspiration. Finally we know that the blood-pressure in the pulmonary circulation is far less changeable than in the systemic.

It is well to remember all this, in so far as we have to do with the influence of respiration upon the action of the heart. But for our comprehension of the Oertel heart-massage, other facts are of much greater significance.

In considering these facts, we note first, the well-known circumstance that in inspiration the elastic force of the pleura and lung acts with increasing strength, so that, at the height of the inspiratory phase, it rises to about thirty millimeters of mercury; that the intra-thoracic pressure upon the heart is, therefore, somewhat markedly negative, and, therefore, contributes towards making the diastole easier, and its excursions wider, while on the other hand it opposes the systole.

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* The manipulations themselves are not original, having been long in use among Swedish gymnasts for different purposes. Moreover, Gerhardt has made use of them during expiration in cases of emphysema; and some German authors besides have recommended them in different forms of asthma. Still, according to my idea, they do not belong to massage, and I merely mention the fact here.

We may further remark, what for our present purpose is of the very greatest importance, that this negative pressure in expiration is diminished considerably; and that, even in violent expiration (when the muscles concerned press the lungs together quicker than their elasticity and that of the pleura can follow, so to speak), it may become slightly positive, for just an instant, during the expiration, *but that otherwise, even during the most extreme phase of forced expiration, no positive pressure is exerted upon the heart so long as the glottis is not closed.* Even in independent expiration, be it never so forced, there always remains a considerable amount of residual air in the lungs, and should the thorax be opened in this stage, both lungs would, on account of their elasticity, be somewhat further contracted, and that this condition would be changed by pressure from without, *i. e.*, heart-massage, only so far as the amount of residual air is concerned. From this fact, and the nature of the chest-wall, it follows, as directly and clearly as possible, that the Oertel heart-massage, as a genuine massage exerting a changeable pressure upon the surface and substance of the heart (which Oertel thought it to be), is wholly illusory.*

I do not believe that any one, who has once made the experiment, would entertain the idea that he (while the patient in any stage of breathing you please, when the glottis is shut and the force of the expiratory muscles causes a positive intra-thoracic pressure) would be able to apply massage to the heart through the walls of the thorax, which are firm and elastic at the same time, and through the lungs,—leaving entirely out of account numerous other problems which arise concerning the influence of such a proceeding upon the patient.

Heart-massage increases, only to a slight degree, the respiratory excursions which have already been much increased through mountain-climbing and interrupted expiration. In these procedures, also, a stronger influence is exercised upon the heart than in heart-massage, which influence may become so marked that when we, either in time or out of time, by means of deep inspirations and expirations, remove the maximal limits of the diastole and systole from one another, we then exercise a kind of gymnastics of the heart-muscle; and we must assume that as such they act both directly upon the heart-muscle and upon the blood-stream in its totality, as well as upon the coronary arteries in particular, which supply the heart with blood and maintain its nutrition.

However, Oertel's "heart-massage" is intended, as has been said, to serve as a complement to the Oertel "terrain-cure," and though, perhaps, one and another may not share my opinion concerning its completely illusory importance; I will here point out that the indications and contraindications of the two methods of treatment do not fully coincide with each other. If we summarize, as I think we ought to, the contra-indications set forth by Oertel and others, and especially by Lichthein, against the terrain-cure, then we must exclude it in sclerosis of the coronary arteries of the heart and the accompanying thrombotic degeneration of its muscular tissue (Ziegler's Myomalacia), as well as in all pronounced or serious changes of the same. It is

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* The essential and fatal mistake in Oertel's conception and explanation of his so-called "heart-massage" consists in this, that he has not clearly and completely distinguished between the expiratory pressure and the pressure upon the heart itself. Thus he says (loc. cit., p. 9): "The amount of the expiratory pressure, or much more that of the pressure which is exerted in the interrupted expiration and external pressure upon the heart," an expression which plainly shows how incompletely he apprehends the infinitely great difference between the two pressures. Nowhere, in his copious and detailed account, does he speak with regard to the important difference due to the fact of the glottis being open or shut.

further contraindicated in *aneurysma-cordis*, in chronic subacute endocarditis, in adhesions between the heart and pericardium, in general endarteritis, in ostium-stenosis, in Bright's disease, and, finally, which should be especially noted, in all heart-affections which show any, ever so little, pronounced condition of incomplete compensation. On the contrary, it does good service in different forms of fatty heart* (according to Oertel, even in pronounced cases where there is stasis and œdema); in valvular troubles, with fairly-good compensation; and in deformities of the chest.

Oertel classes under contraindications to "heart-massage," all fresh or repeatedly relapsing endo- and pericarditic processes, acute and subacute myocarditis, sclerosis, and atheroma of the coronary arteries, as well as of the arteries in general. Oertel prescribes "heart-massage" in all debilitated conditions of the heart, whether they be due to malnutrition, or to incomplete hæmatosis, or to the formation of fat, or to fatty heart; in cases of insufficient filling of the arterial system, and of stasis in the venous system, chiefly the result of insufficiency of the cardiac muscle; in labored heart-action resulting from heart-failure; obstruction of the circulation in emphysema, kypho-scoliosis, tumors, etc.

It seems probable that the essential difference between the applicability of the "terrain-cure" and of "heart-massage" consists in this, that the latter may be employed without danger in some cases of heart-affection with incomplete compensation, while one may not without danger put upon the heart the increased labor involved in the "terrain-cure."

Oertel has obtained, by means of "heart-massage," "completely satisfactory" and, to some extent, astonishingly good results, which are to be published at some future time. I have not obtained such results by the diet- and terrain-cure, which, (with the exception of the limitation of fluid ingesta), I make use of with proper precautions in many cases every year. Therefore, for the reasons which I have set forth above, I shall never, for my part, "round out" the "terrain-cure" with "heart-massage," for which I prophesy a short and insignificant existence, in spite of the powerful support of Prof. Oertel's justly honored name.

Since I have reported upon Oertel's "heart-massage," I must not omit to mention Hünerfauth's massage of pleuritic-exudation after a wholly terminated pleuritic process. So far as one can judge from the not very clear description of it, this form of massage is performed in a manner analogous to "heart-massage." If adhesions exist upon both sides, then Hünerfauth compresses the thorax on both sides, with his hands, during inspiration, in order to exert pressure upon the pleuritic residues, and to increase the friction between the costal pleura and the pulmonary pleura. Where there are remains of inflammation on one side, Hünerfauth, it would seem, applies massage sometimes "with relaxed thorax"; sometimes during the inspiration under opposing pressure furnished by placing the other hand upon the other side of the

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* In practice most would prefer, in doubtful cases, to let their patients take bodily exercise on smooth ground rather than send them to the hills. Oertel's "terrain-cure" is mischievous and dangerous, if it is used without discrimination. However, Oertel himself is more urgent than formerly in his warnings to be cautious; and with good reason, for, as I could show, mischief has frequently been done, especially in the period of early enthusiasm, by means of the "terrain-cure."

chest. Hünerfauth, who at the beginning of treatment gives a sitting of about ten minutes' duration and later increases to two sittings of twenty minutes each daily, has, in this manner (together with the help of gymnastics, douches, and warm, wet bandages), "cured" four cases of severe *pleuritis fibrinosa adhesiva*. The average time of resorption was six weeks. My opinion of the "pleura-massage" may be inferred from my remarks on "heart-massage." *

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* That which has been written above completes what I am disposed to say of massage of the organs of the thorax. Nevertheless, still other examples exist in literature for our encouragement and imitation. I will mention only one of these, and that in spite of the danger of being reproached that I too frequently "*venir à mes moutons.*" I bring it forward as a gymnastic curiosity. There lies before me a work entitled "Cure of Inflammation of the Lungs by the Manual Treatment of H. Kellgren, from the Royal Central Institution in Stockholm." Mr. Kellgren informs his readers, without a word as to the reason for his opinion, nevertheless with much solemnity, "that almost all" inflammations of the lungs are due to a rheumatic affection of the intercostal muscles and the diaphragm. The originality of this idea, (which, if it were possible, is surpassed by the originality of other ideas of Mr. Kellgren), may be explained by the vague notions which this former Lieutenant and present Director has (1) upon inflammation, (2) of the lungs, and (3) of inflammation of the lungs. It is entertaining reading, however, and therefore, taken in connection with some other uncouth expressions regarding the treatment in question, possesses a specific value; which, however, is of a different nature from that intended by the author. I forego further description of the treatment here; because there are very few, I imagine, who will read my book that would be willing to treat inflammation of the lungs by means of massage. Still I allow myself in all friendliness to ask, "Why is it that Mr. Kellgren gives out in foreign parts that he is from the Royal Central Institute, and omits an essential part of the title of that highly deserving institution, so far as school and military gymnastics are concerned, which title runs as follows: The Royal Central Gymnastic Institute?" Mr. Kellgren's dissertation loses much of its value as a means of entertainment after a day's hardship, on account of this circumstance. "We note the purpose and are put out of tune."

CHAPTER XV.

DISEASES OF THE INTESTINAL CANAL, AND OF THE ABDOMINAL CAVITY.

I have set forth the most important physiological factors concerned in abdominal-massage, already, in the general part of this book, on pp. 65–67. From what is said there, it follows that this form of massage has, for anatomical reasons, an extensive sphere of influence, though that influence is not yet completely understood. It exerts an influence upon the circulation of the blood in its totality, upon secretion, the appetite, the digestion, and upon the function of assimilation, upon peristaltic action, and on defecation, upon the interchange of material in the intestinal epithelium, and, finally and not least of all, upon the nutritional condition of the *muscularis mucosæ*.

It is obvious, therefore, that its therapeutical capabilities are great. From a practical point of view, also, abdominal-massage is of great importance in the treatment of certain "stomach-diseases," particularly those that are among the most common concomitants of civilized life.

I have characterized the influence of abdominal-massage upon the muscular coat of the intestines as one of its most influential effects, because the muscularis is gradually strengthened through the oft-repeated stimulation of the massage; and it is in just those affections, in which disturbances in the functions of the muscularis play the principal part, that abdominal-massage is most obviously useful. In dilation of the stomach, and, above all, in habitual constipation depending on atony of the colon, abdominal-massage commonly promises better results for our patient than any other treatment whatever, when no contra-indications exist.

As in the case of exudations in general, so for exudations in the abdominal cavity, massage may be used to promote their absorption. It has also been employed repeatedly with good results, both for perityphlitic and peritoneal exudations. I shall speak of these matters in more detail further on, where I shall also

consider the scruples which may present themselves to the cautious practitioner against this method of treatment, which is certainly excellent in many cases.

As to some other affections of the stomach, we are not in a position at present to determine the value of abdominal-massage for them; partly by reason of our still incomplete knowledge of the diseases in question, partly because of our equally incomplete knowledge of the influence of mechanical irritation upon the functional activity of the nerves and glands. Regarding the relation of massage to the dyspepsias and the various neuroses of the stomach, we must needs speak with great reserve.*

In connection with these general considerations regarding abdominal-massage, I would remind the reader, further, of the contraindications set forth on pages 68 to 73. In cases of pregnancy, of large ovarian cysts, or of neoplasms in the abdomen; in hydronephrosis, and of hemorrhage in the urinary passages, with colic from renal calculi; in cases of ecchinococcus in the liver or in other parts of the abdominal cavity; in acute inflammations and catarrhs, strangulated hernia, ulcerations in the digestive canal, especially in cases of gastric ulcer, we should not resort to abdominal-massage. It is inadmissible also in aneurism of the abdominal aorta; and furthermore is excluded where a heightened intra-arterial pressure may import danger (see p. 73). In cases of simple hernia, of gall-stones, of floating kidney, or of floating spleen, it must be performed with careful reference to these conditions.

In regard to the technique of abdominal-massage, in spite of what has been said under this head (pp. 47 to 50); I will here

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* I omit entirely from this book all consideration of the claims which have been made in certain French and even German works, for the usefulness of massage in certain affections where, it seems to me, its efficacy is more than doubtful. Very few of my colleagues, I take it, would be especially inclined to employ massage in chronic hyperæmia or cirrhosis of the liver, or of an insufficient secretion of bile, or in cases of biliary calculi. Certain French physicians (according to Estradère) have included the following in the many services of massage, viz.: that icterus of the newly-born "disappears in almost all cases through (*i. e.*, during) massage." If these gentlemen would only consent to leave the little yellow creatures in peace they would discover that the icterus in "almost all" of these cases disappears without massage, a by-no-means surprising fact to any physician.

The manipulations that may be made upon the abdominal wall in cases of ileus, volvulus, invagination, and coprostasis, according to my notion, no more belong to massage than does taxis in hernia, for instance; and, therefore, no mention is made of them in this work.

repeat that this most important form of massage is extremely simple, and, even in unlike affections, is quite uniformly of one sort; that it consists essentially of small, circular frictions, which one makes upon the appropriate portion of the intestinal canal, by means of the anterior wall of the abdomen; that one should not use any ointment on the skin; that the masseur causes so much of the patient's skin as lies under his fingers to follow their movements; that the fingers, in this connection, should be held in a position of over-extension, so that the greater part of their volar side exerts a pressure; that the patient ought to lie upon his back, with flexed knees and somewhat abducted thighs, so that he may breathe quietly and freely.

Since we often have to do, in these cases, with an atonic condition, which is more or less common to all parts of the digestive canal, it is almost always best to manipulate it throughout its whole extent, when it is accessible, though the most labor is to be expended upon that portion which stands in greatest need of treatment. In simple atony of the colon, we begin thus over the cæcum, and follow the course of the whole viscus, and, working alternately with both hands, spend some time on each portion, till we gradually reach its lower part and arrive at the symphysis. But we must not omit to bestow a part of our labor on the stomach and the small intestine. In case of dilatation of the stomach, we devote ourselves to the stomach chiefly, but ought not to omit completely the above-described treatment of the colon.

One may undertake the sittings at almost any time, but should avoid giving them too soon after a meal; the best time is just before a meal. The sittings should last at least a quarter of an hour. During the early days of treatment, it will be uncomfortable for the patient and cause tenderness of the abdominal wall, a condition that will pass away very soon.

Abdominal-massage may be performed by almost anybody,*

*I find in No. 1, of Schmidt's Jahrbücher, for 1888, page 37, a report upon "Massage of the Abdomen by means of Iron Balls," by H. Sahli, of Berne. Sahli enjoins that the patient himself, while in the supine position, should roll a cannon-ball, weighing from three to five pounds, over the course of the colon. In spite of the indignation which my utterance may occasion in those who seek to surround massage-technique with a nimbus of purely mystical difficulties; I agree with Dr. Sahli's opinion that, in some cases at least, the effect of this procedure is wholly admirable. I do not know whence this method originated, but I heard of it some six or seven years ago, from a patient who used to roll a small, leather-covered

so long as it is for dilatation of the stomach, or for habitual constipation with atony of the intestine. The treatment is monotonous and tedious; nevertheless it yields more satisfactory results, perhaps, than any other kind of massage. Frictions applied to the residual effects of inflammation in the abdominal cavity should be performed only by physicians.

Chronic constipation, by which we mean a condition in which a person, with a normal supply of chyme in the small intestine and a normal amount of fæces in the large intestine, suffers, for a long time, by reason of his failure to have daily movements of the bowels. As every one knows, such a condition is due to a variety of causes.

In a summary way, we may remind ourselves that constipation in general may arise through—

I. Diminution of the peristaltic power of the intestine (*a*) chiefly, and in the first place,* by reason of changes in the muscularis. We may place in this category those numerous cases of chronic catarrh of the colon, in which the muscularis, being saturated with serum and relaxed, ill performs its function; constipation depending upon degenerative conditions, following or accompanying severe constitutional diseases; those rather common cases, in which a portion of the intestinal tube suffers from diminished peristalsis, by reason of rigidity due to inflammation within or near it (perityphlitis); also those numerous cases in which the disturbed circulation within the intestinal canal is accompanied by a weakened condition of the intestine (*e. g.*, when there is a lack of bodily exercise in diseases of the heart, lungs, liver, etc.); to some extent, also, those affections that result from senility; and finally, the by no means infrequent cases of habitual constipation, after childbed, which is caused, perhaps, by the strong distention of the intestines by gas, so that they fill the enlarged abdominal cavity, and the muscularis becomes too weak, on account of this distention, to perform its functions.†

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cannon-ball over his abdomen, and was in the highest degree satisfied with the results. Still, I have learned since, that in spite of the ball, success is lacking in many cases in which manual massage produces immediate effects.

* Things in nature never present the same appearance as those in a scheme, and the above doctrine "limps" in the usual manner when applied too rigorously to special cases. Several causes co-operate. In many cases of constipation, for instance, in severe cases of hypochondria, with chronic catarrh of the colon, one cause frequently gives rise to another (thus, in paresis of the intestine, due to changes in the nerve-centres, the nutritional condition of the muscularis suffers from its own inactivity) and *circuli vitsiosi*, so common in nature, occur multifariously in these cases, so that an effect in turn becomes a cause, *e. g.*, a chronic catarrh of the colon produces atony of the colon, as a result of which constipation, with an obstinate and great collection of fæces, arises, which condition, in its turn, maintains the catarrh.

† That form of habitual constipation, which was formerly so much talked of as the result of relaxation of the abdominal muscles, is now relegated to its place among incorrect conceptions. These muscles, together with the diaphragm, may indeed contribute, in some degree, to the act of defecation, but a much more potent factor in t is to be found in peristalsis.

(*b*) Chiefly, and in the first place, on account of disturbed relations of innervation; those that occur in central processes in the brain or spinal cord, whether they proceed from known pathological causes, *e. g.*, of an inflammatory, syphilitic, hemorrhagic, or neoplastic nature, or from causes whose pathological nature is not understood, *e. g.*, as in hypochondria, melancholia, hysteria, or neurasthenia; those that sometimes proceed from altered stimulation- and reflex-influences, which are certainly operative in very many instances, either as regards the intestines (*e. g.*, when the excrement contains a diminished amount of bile), or as regards other structures, *e. g.*, from the ureters during or after the passage of urinary calculi; and again those occurring in certain intoxications, *e. g.*, from opium, lead, etc.

II. Diminished lumen and increased resistance in a section of the intestine, due to cicatrices, pressure from tumors or from a gravid uterus, to peritoneal adhesions, twisting of the intestine, invagination, hernia, spastic-contracture, coproliths, etc.

Those who are familiar with the way massage works will readily perceive what forms of constipation, that are mentioned above, are most likely to be benefited by it. If the constipation be due to disturbances of nerve-centres in the brain or spinal cord, we can only reckon on good results when these disturbances are of the milder sort, *e. g.*, in the lighter forms of psychosis.* If, on the contrary, we have to do with destructive processes, there will be no prospect of a lasting restoration of normal defecation. The same statement usually holds true when an increased resistance to the passage of the contents of the intestine lies at the basis of the constipation. Finally massage cannot be of any particular value when the amount of bile in the bowels is less than the normal. In all these cases massage cannot affect the cause of the constipation, at least to a degree worth mentioning. Usually it can effect nothing more than to press the fæces into the rectum, and thereby contribute temporarily to a stool. For this purpose and for the sake of maintaining a normal condition of the muscularis, we may employ massage in these cases, if we choose, provided there be no contraindications evident.

In such cases as those classed under I (*a*)—cases that are due chiefly to alterations of the muscularis—massage, when the alterations are not too profound, is our very best remedy,† and, with-

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* That form of habitual constipation which frequently occurs in melancholic and hypochondriacal patients may be treated, often successfully, by means of abdominal-massage. (See p. 252, Case 2.)

† The expression has been deliberately chosen, and I will stick to it. For a special motive, I take the liberty of pointing out the enormous difference which exists, in this connection, between the use of alkaline-saline mineral waters and massage, the difference being in favor of the latter. Here in Carlsbad we are wont to see a throng of

out doubt, has greatly increased the probability of our being able to restore patients of this description to sound health. In fact, in cases of simple atonic constipation, be the other symptoms ever so severe, one runs very little risk if he assures the patient that he will regain nearly normal functional powers of defecation. In the hundreds of such cases that I have treated by massage, or handed over to others for massage, I can recall but very few negative results; while I remember many wherein despairing patients were completely and permanently cured of troubles that had plagued them severely for years. Generally when massage is employed in these cases, passages of the bowels begin in the course of a few days, frequently after the first massage-sitting. Still, even here we must prepare the patient, at the outset, for a rather protracted course of treatment, one that may last for several months before such a result shall become permanent; otherwise the patient is liable to gradually relapse more or less completely into his former condition. In severer cases, the massage should not be discontinued until daily stools have been continuously regular for a month or two; after that it may be better to let the patient have massage every other day for a considerable time. Obviously, the prospect of recovery is most favorable for lean patients with thin abdominal walls. Corpulent patients do not constitute very hopeful cases and it is better to put them through a "flesh-reducing treatment" before we begin to give them massage, or let others do so. When the constipation ceases, the patient's condition in other regards changes for the better, as we know; the appetite is increased, the flatulence, which is often extremely troublesome, is diminished, and the

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patients who suffer from chronic constipation, and who improve temporarily during the springs-treatment, under the influence of the water of our springs, which is in many respects very excellent doubtless. But, in the great majority of cases, the old troubles soon return, just as happens when patients stop using other laxatives. On the contrary, those cases of chronic constipation that are treated simultaneously by massage and the drinking of Carlsbad-water, or even without the latter, show a wholly different course. These cases, when the treatment is continued for a sufficiently long period, become lastingly cured, or, at least, much improved. Some of my colleagues are decidedly unwilling to admit this fact. Nevertheless it is quite as much for our own interest as that of our patients that we should remember that the latter do not come here "in order to drink water" but to regain health, and that we have the same right and duty as other physicians to employ the surest means to that end. If we do not do so, we shall gradually sink to the mere level of distributors of water, and fulfill an office scarcely higher than is exercised by those persons whose daily business is to sprinkle plants in a green house. If we have not the time to perform abdominal-massage ourselves, a sufficient number of male and female persons are to be found who can administer it better than almost any other form of massage.

general nutrition of the patient is heightened; the patient's psychical condition, which in severer cases is frequently very trying, may be strikingly improved.

Except when the patient was a "Carlsbad guest"—who always or almost always may be assumed to drink of the Carlsbad-waters—I have not employed any other measures than abdominal-massage, but have simply encouraged the patient to take a proper amount of exercise. Still I am not prepared to deny that electrical, hydrotherapeutic or gymnastic treatment might contribute to quicker results.

I give below an account of a few cases which I have selected from the abundant material on which I have notes, or which I had an opportunity of controlling after treatment had ceased :—

1. A. S., litterateur, thirty-six years old, consulted me May 24, 1884, in Carlsbad, where he had taken the springs' treatment previously, three separate times in as many years. He had already, without consulting a physician, drunk daily, for three weeks, five hundred cubic centimeters of the alkaline-saline water from the cooler springs, and restricted himself to the Carlsbad-diet that is usual in such cases. The patient, who was very thin, had suffered from habitual constipation since 1875. At home he usually had one stool a week, on the average; during the springs' treatment his condition usually improved to the extent of his having two stools a week; and during the first three weeks he passed in Carlsbad such was the case. (When the patient reached home after visiting Carlsbad he had always immediately relapsed into the 'status quo ante.") The patient was healthy in other respects, although he was somewhat anæmic and was not a particularly strong person. I saw no reason to make any change either in the patient's drinking of water from the springs or in his mode of life; but gave him abdominal-massage every morning, during the three weeks that he was able to remain at Carlsbad. During those three weeks the patient had one stool a day, without exception, which condition of things continued for a considerable period after his return home. Nevertheless, as he later on lived a sedentary life, there came periods, though not for nearly two years after his massage-treatment, when he had a stool on every other day only. The patient, whom I had frequent occasion to meet, continued in this case for some years; and as a general result thereof "felt better in body and soul than he had for the ten years prior to the massage-treatment," although he gave less heed to his health and took less bodily exercise. In 1888 he began again (when he took too little bodily exercise, and his stools, therefore, began to be somewhat dilatory) to take a short "massage-treatment" every year.

I have introduced this case chiefly because it shows clearly the difference in value between massage and alkaline-saline remedies in simple "atonic constipation." It is, however, not a fair representative of the cases that are usually so treated, as most of them require a much longer period of treatment before a permanent improvement is attained.

2. J. A. P., a notary, thirty-three years old, was in the Seraphim Hospital, in Stockholm, December 15, 1883. The patient came of a psychopathic family, suffered from "nervousness," and had been hypochondriacal since his twentieth year. In the autumn of 1881 he began to suffer from irregular stools, to which were soon added eructation, stomach-ache independent of meal times, heaviness in the head, lassitude, and vomiting now and then. His constipation finally increased to such an extent that latterly, for years, he never had a spontaneous stool. Once, when for seventeen days he took no laxative or injection, he was constipated without cessation for the whole period. He became weaker and weaker, and much emaciated. In 1883 he

began to undergo treatment by means of mineral waters, diet, etc., at times within the hospital, at times outside it.

When he entered the Seraphim Hospital, he was extremely pale and thin in appearance, and had a temperature of 36.4° in the afternoon. The patient keeps in bed; is very weak; appetite and sleep are very good. He is depressed in spirits and hypochondriacally restless. His thoughts are almost continuously directed to the condition of his health. There is some tenderness on pressure over the ascending-colon; and throughout its whole extent the colon is pretty full of excrement. The stomach is not dilated; its greater curvature reaches only to a point 5 centimeters above the navel; and there is no sensitiveness to pressure in the epigastrium, nor is there anything else abnormal, excepting a trigeminal neuralgia and myitic swelling in the trapezius muscle.

The patient was given an enema and was put on a restricted diet, and a solution of hydrate of calcium was prescribed. On December 24, all other treatment was stopped, and massage over the colon was administered once every morning by me, and once every afternoon by the medical student on duty. This was continued till February 25, 1884. During this time the patient had an unaided stool on the following days: December (1883) 24, 26, 28, 29, 30, 31; January (1884) 3, 4, 5, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 24, 25, 26, 27, 28, 29, 30, 31; February 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 25. The massage treatment now ceased, but no other change was made. During the remainder of February and a part of March he had stools on the following days: February 27; March 2, 3, 4, 5, 6, 7, 8, 10, etc.

Later still, the patient had daily stools, but no massage or other remedy, until his discharge, May 31. After January 15, he was out of bed in the daytime. His bodily weight increased from 133 pounds December 20, 1883, to 147 pounds May 13, 1884. His psychical condition, though somewhat improved, continued bad. I have recently heard (1889), from a physician who knows the patient, that during the last few years the patient has been relatively well.

3. Mrs. S., forty-five years old, received thirty sittings of abdominal-massage between the middle of March and the end of April, 1884. The patient, who was otherwise sound, presented a moderate retrodeviation of the uterus, and there was a fibroid on the cervix as large as a nut. Her constipation appears to be entirely independent of these anomalies. She has had two confinements and suffered from constipation since the first one. Meanwhile she has sometimes employed enemata, sometimes saline, and sometimes other aperient remedies; without their use her stools were lacking for at least several days in succession. When treatment was begun, the stools immediately became daily events; when it was cut short, the constipation returned in a milder form, though the patient did not have to return to the use of aperients. At the end of September, of the same year, the massage-treatment was resumed, and about forty sittings, at the rate of one a day, were given, when the stools became normal in number. Now (February 2, 1890,) the patient declares that during the entire interval of more than five years, during which she has neither had recourse to medical treatment nor to aperient remedies, her bowels have been tolerably normal as to regularity of movement, her stools being one a day, as a rule, though she has had periodical interruptions for a few days at a time.

4. Countess X., about thirty years old, had, in all, eighty-four sittings between the beginning of January and the beginning of April, 1884. The patient was very healthy in other respects, but had suffered for several years from irregular movements of the bowels; which condition grew worse, after several confinements, till for some years she

has never had a movement of the bowels without taking an enema, which happened every other day. From the beginning of the treatment, the trouble was completely abolished, and when the treatment ceased this condition continued, so that the patient has had a stool spontaneously daily, or every other day, until now, 1890.

5. John Charles P., somewhat over a year old, after being taken to the Polyclinic, was received, December 5, 1887, into the General Foundling Hospital, in Stockholm. The patient, whose movements had always been sluggish, had suffered severely for the last two months from constipation. For this he had been treated by means of injections of water. For a little time he had similar troubles, but had improved, it was said, through the application of abdominal-massage.

The patient is pale and atrophic, the abdomen is enormously distended, with symptoms of meteorism (62.5 cm. in circumference); through the abdominal wall the greater part of the much distended colon is evident. Nothing abnormal is to be found in the rectum. The spleen and liver are of normal size. Of ascites there is no evidence, or only the most insignificant trace. There is no rachitis. The urine contains a trace of albumin.

The intestine was washed out, which caused the escape of an enormous amount of gas, accompanied with but little excrement. Porla water, a Neptune's girdle, and abdominal-massage were prescribed. The latter, consisting of kneadings and strokings, given in the manner described by me above, and especially demonstrated for this case, was given daily; at first, it was given by a medical colleague, and later by a particularly excellent nurse. The result, however, was rather unsatisfactory; although, now and then, the patient had a spontaneous stool, and the circumference of the abdomen became somewhat diminished. Constipation was continually severe, excepting on December 13, when diarrhœa, with vomiting, and rise of temperature, took place. Under the influence of diet and some opium, this completely ceased after a few days. At the same time the massage-treatment had to be entirely given up, inasmuch as on the 28th of December a moderate but continued fever, characterized by evening exacerbations and an irregular curve, set in; subcutaneous abscesses formed here and there. January 13, 1888, bronchitis showed itself, in addition.

On the twenty-fourth of January the stools became numerous and finally vile in odor and very loose. On the morning of January 26, the temperature reached its highest point, *i. e.*, 40.2 C., and then began to sink slowly; hypostatic symptoms appeared in addition, and the extremely exhausted patient, who was simultaneously systematically treated by means of febrifuges, excitants, etc., died on January 29. The post-mortem examination disclosed a normal heart, bronchitis in the lungs, and a hypostatic pneumonia. On opening the abdomen the colon was found enormously distended, having a diameter of 8.5 cm. at the *flexura lienalis*. At the point of transition between it and the sigmoid flexure it was suddenly narrowed. This portion had a very short mesentery, against which the flexure, which was again much distended, lay strongly bent up. The rectum was normal. In the ascending-colon, as well as upon both sides of the narrow place which has been mentioned, numerous small sharply-defined ulcers, extending to the muscularis, appeared. The broadest portion of the incised colon was 20 cm. The contents of the intestine were yellow, loose, and of vile odor. The small intestine was normal, except for some swelling of the Peyer's patches. The spleen and liver were of normal size, the latter being somewhat hyperæmic. The kidneys showed some coloration of the cortex.

It is not easy to determine whether the constipation was exclusively of a simple atonic nature from the beginning, or to what degree the narrow place above the sigmoid flexure had contributed, in the rôle of a structural anomaly. Beyond question the

ulcerous process first arose toward the very end of the patient's life. It is probable that massage, seasonably begun and long continued, might have saved the patient's life. Still the pathological changes were pronounced and the general condition miserable at the time the patient was taken into the children's hospital, and none of us, who saw him then, hoped for much from the treatment.

Dilatation and atony of the stomach, according to my firm conviction, in cases free from malignant neoplasms, or when other contraindications are absent, should be treated by means of massage, which not infrequently shows itself to be a particularly potent and valuable addition to other means of treatment. Whether the dilatation of the stomach proceeds from a non-malignant narrowing of the pylorus, or of the duodenum, from relaxation attendant on or following severe constitutional disease, from disturbance in its innervation, or from habitual overburdening of the organ, then massage contributes to the development and maintenance of muscular hypertrophy, which also in these cases is to a certain extent compensatory; just as we assume that it exercises an influence upon the changed secretions and the accompanying chronic catarrh.

There is no doubt that massage, in the earlier stages of the disease, may prevent its further development. It is probable, also, that when it is employed in conjunction with other remedies in such cases, it may be able to bring about a return of the organ to its normal size, concerning which I have heard positive opinions affirmed by trustworthy professional colleagues. Still, I will not make any such claim for the influence of massage, since I must admit that I have never been able to determine such a result with certainty.* On the contrary, I have frequently seen that massage caused a simultaneous abatement of the symptoms and a notable improvement, in certain cases (which had previously continued quite intractable to all other usual remedies), without any perceptible change in the volume of the stomach occurring.

The technique is as simple as possible, and consists of small circular frictions (described above as belonging to abdominal-massage) which frictions, in order to produce strong stimulation of the muscularis, may sometimes be executed in a jerky manner,

* Since we have such an authority as Kussmaul for the statement that there may be a return to normal limits without massage, even in well developed cases; we need not doubt that it is possible that such a result may be obtained when that powerful means is added to the treatment.

so that the manipulation resembles tapotement in its effect, although the finger of the masseur remains continuously in contact with the skin of the patient. The sittings, which may be given by persons instructed in massage, but in other respects having no medical or technical education, must take place at least once a day, or better twice a day. In the more fully developed cases, massage will have to be continued, with short interruptions, during all the rest of the patient's life.

In the treatment of dilatation of the stomach, we should employ all hopeful means at our command, viz., light, frequent meals, which contain the most easily digested food stuffs, chosen according to the bills of fare drawn up and made known by Leube (see the Weir Mitchell cure below). When necessary, the digestion must be assisted by hydrochloric acid and pepsin, faradization of the stomach, washing out of the same (with Carlsbad-water if the patient be at Carlsbad), either on the patient's rising in the morning or on retiring at night, and, finally, a properly-constructed bandage. These, together with massage, will accomplish all that can be accomplished.

I adduce two cases here. The one is typical of what I would call atony of the stomach. The other was a case of well-developed dilatation, and the first case of the kind in which I, and many besides me, observed the evident influence of massage, which for the nonce was greater than usual.

1. Miss V., æt. twenty-eight, from Norway, arrived in May, 1885, in Carlsbad. She first consulted me after she had spent three weeks at that health-resort. The patient had suffered for four years from dyspeptic symptoms and severe constipation, but not from habitual nausea. The diagnosis, which she brought with her from one of the first physicians of her country, read *dilatatio ventriculi*. Her visit to the health-resort and drinking the alkaline saline water had not done the patient any good to speak of. In particular, she never had a stool unless she took her customary aloetic pills.

The patient was extremely thin; before her illness she weighed about 64 kilograms, but at this time she weighed only about 45 kilos. She had a strong anæmic murmur over the vessels of the throat; her mucous membranes were pallid; and she was nervous and much depressed, as well as mentally affected by her illness.* After the patient had taken an effervescent powder, the limits of the stomach could be defined with unusual precision through percussion. It appeared to reach as far as the navel, but scarcely below it. The gastric juice was not examined.

I recommended massage to the patient, which, in conjunction with appropriate diet and a small amount of Carlsbad-water, constituted the treatment. It was daily administered for three weeks. Thereupon daily, spontaneous stools immediately set in; she increased in weight, and her general condition quickly improved. However, the patient had to leave Carlsbad after twenty sittings, and was advised to continue similar treatment at home. This, however, she could not do to her satisfaction, and she began to relapse; on which account she came to Stockholm in February, 1886, and received from me eighty-two massage-sittings on as many days. Thereupon, the patient again quickly improved, in that her appetite increased, the movements of the bowels were normal, and her strength and body-weight increased. Now, in March, 1890, in

* If the patient had had time to submit to it, I would have prescribed the Weir Mitchell treatment for her, as it was indicated in her case, without doubt.

reply to my inquiry, the patient states that she has continued well without any further treatment whatever, and has daily stools. Her weight has varied, since she was treated in Stockholm, between 60 and 64 kilos.

2. Wilhelmina P., domestic, about thirty years old, was received, late in the autumn of 1887, into the University Hospital at Upsala, where, at the beginning of the ensuing March, she came under my treatment, during my service as interne. The patient, during her stay in the hospital, had been treated with all the usual means for gastric catarrh and dilatation of the stomach. In spite of the variety of measures, such as washing out of the stomach, regulated diet, faradization of the stomach, etc., the markedly emaciated patient was in a tolerably wretched condition, characterized by diminished strength, weak appetite, daily vomiting, and stubborn constipation. The point of the sound introduced into the viscus could be felt somewhat above the symphysis pubis. Professor Waldenström, since deceased, in addition to the other treatment, prescribed abdominal-massage, which was performed by me twice a day without any other change of treatment. Thereupon, from the first day of massage, the vomiting ceased, the appetite improved, her body-weight increased,* and her strength as well. While I was absent on a journey for some days in April, and massage was consequently interrupted, the vomiting set in again, but ceased as soon as the massage was resumed. At the end of May, after the massage had been continued for nearly three months, I examined the volume of the stomach. I could not determine with certainty that it was diminished. In the autumn of that year, when the patient was discharged from the hospital, she was in all other respects much improved.

Perityphlitic exudations, like other exudations, within or in the neighborhood of the abdominal cavity, of which exudations I take this as a type, may be treated with massage, when the inflammatory process has run its course. This procedure promotes absorption, thereby removing, oftentimes, the frequently existing constipation; abolishes the feeling of heaviness or even pain due to the presence of the products of inflammation; and also diminishes, so far forth as it causes a complete resorption, the danger of a renewal of the acute inflammatory process.

In these cases, too, the technique is extremely simple. One makes pressure, by means of the last phalanges of the three middle fingers, upon the wall of the abdomen, over the exudation, and executes with slight but regular pressure the friction-like manœuvre described above, on page 48. The sittings are short at first, but later are regularly lengthened. In this connection the patient takes the position described as belonging to ordinary abdominal massage (see p. 248).

Still, although we may say that, by bringing about complete

* In spite of a thorough search, during a visit to Upsala, for the journal in which the details of the case were more accurately recorded than in my notes, I have not been able to find the journal. Wherefore I must content myself with the above account, in order to give the reader an understanding of the influence of massage.

resorption of the exudation, the danger of a new inflammation in the future is diminished, there can be no doubt that this danger, due to the mechanical influence of the procedure, is augmented during the period that massage is applied. The shorter the time that has elapsed, since the termination of the inflammatory process, the less complete its cessation and the more susceptible to pressure the affected part is, as the result of the same,by so much is the danger greater of causing a relapse. It is then an imperative rule, in these cases, to put off massage-treatment for a considerable time, in short, till several months have elapsed since the perityphlitis, and then to carry it out with extreme caution; and to stop it immediately, at the slightest warning afforded by increased tenderness to pressure and spontaneous local pain. We should not forget that this serious danger continually threatens to a degree which we may not clearly comprehend, since we are never in a position to know the details of the process which has run its course. The cause of that process, its relation in minute, but possibly weighty, details to the peritoneum, to the vermiform appendix, etc., remains a riddle; since beyond palpation and subjective symptoms we are without means of guidance.

Finally, in addition to the old and excellent practical rule, to abstain at all hazard from doing an injury, and, therefore, in general, to prefer doing nothing rather than initiate measures that may easily prove dangerous, many will be influenced by the consideration that, when perityphlitis, which is peculiarly prone to relapse, does recur in the course of massage-treatment, the patient and his friends will very rarely refrain from attributing the relapse to the use of massage.

From the foregoing it may be considered a matter of taste, in many cases, whether or not an exudative residue following perityphlitis should be massaged or not. I have, myself, treated a number of such cases by means of massage (some with very good results, some with tolerable results) without disaster. The experience of some of my colleagues, who have had less good fortune, however, makes me little inclined to undertake massage in these cases before a considerable period has elapsed after the inflammation.

S., a merchant, forty-five years old, was taken ill in February, 1887, with perityphlitis, which was treated by me in the usual manner, by means of absolute rest, regulated diet, opium, and ice, and ran a favorable and tolerably rapid course. In

the spring of the same year the patient suffered from the usual sequelæ of the disease in question, and inquired about the prospect of massage-treatment. Inasmuch as I emphasized the danger which might arise from such treatment, if given soon after the disease, the patient gave up the idea of having it. I did not see him again until recently, when he came to me on January 9, 1890, and declared that he had a constant feeling of weight and pain in the ileo-cæcal region, which hindered him from mounting his horse or from vigorous motion, and never allowed him to sleep except on his back. As soon as he turned on his side when asleep he was awakened by pain. His stools, though occurring daily as a rule, were difficult. On palpation it appeared to me that I could clearly make out a residue from inflammation. After twenty massage-sittings, on as many days, the patient reported that he had been enabled to sleep quietly on his side the entire night, for the first time since his illness. His troubles in other respects were considerably diminished. Still, at the time these lines are written, at the beginning of March, the patient, who has slight reminders of the inflammation now and then, continues the treatment.

Chronic catarrh of the stomach is treated by some physicians by means of massage, which in this, as in all other branches of practice, has its advocates. However, we may boldly say that, owing to the lack of satisfactory investigations, we do not know how massage affects gastric catarrh by itself considered. We may likewise venture to say that this has never formed the principal remedial procedure in such cases, and that in the future, as in the past, it will occupy a position subordinate to dietetic measures, the use of mineral waters, washing out the stomach, etc., and that only "specialists" will indulge the thought of treating simple gastric catarrh by means of massage. By reason of the almost invariably good results attained by means of abdominal-massage in a vast number of cases of constipation, among which a goodly contingent suffer from catarrh of the stomach, and also by reason of the incontestably good effects of massage upon chronic intestinal catarrh (which frequently is the origin of the same patient's constipation), and upon other chronic catarrhs, we are fully justified in assuming that massage may also prove serviceable in the treatment of chronic gastric catarrh. Still, it cannot be of very much avail, as only a small portion of a normal-sized stomach is accessible for massage.

True Dyspepsia.—The same uncertainty exists concerning genuine dyspepsia.* In these cases, too, we are without scientific knowledge concerning the influence of massage upon the composition of the gastric juice. It is easy to assume that just as the gastric juice, as a whole, is certainly increased through mechanical irritation, so the pepsin and hydrochloric acid, which are indispensable for digestion, may be increased in amount, and the character of the gastric juice thereby changed. But for the present we are not warranted in making positive statements in this connection.†

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* By true dyspepsia, I mean a condition of disturbed digestion, depending upon anomalies in the composition of the gastric juice.

† It is difficult to institute investigations on this point, on account of the many influences, *e. g.*, bodily and mental actions, which may exert an influence upon the composition of the gastric juice, even under dietetic conditions that are precisely alike, as well as from the impossibility of exercising any control over what passes through the pylorus, etc. To have any value, the investigation should be continued throughout a considerable period. One should, for a long time, make daily examination of the gastric juice an hour after the usual test-meal of one cup of tea, without sugar and milk, and one wheaten roll, without giving massage; and should later repeat the examination under entirely similar conditions in general, but after a massage-sitting. It is not improbable that by means of analysis, under the last named conditions, one would find a larger average of hydrochloric acid in the gastric juice.

On the other hand, there is no doubt that the symptoms that are present in dyspepsia diminish or disappear under abdominal-massage. Surely, every one has had experience of this who has employed massage for chronic constipation, in which affection dyspeptic symptoms are so extremely common. Patients often declare that the feeling of pressure, heaviness, fullness or pain, which is felt in the epigastrium after or independently of meal-times, abates; that the belching ceases, the appetite is increased, etc., etc. It may be stated positively, that massage is not to be thought of when the dyspepsia coexists with cancer, or with a still unhealed gastric ulcer; and that, on the other hand, it must be employed when the dyspepsia coexists with dilatation of the stomach. If dyspepsia occurs independently of these affections, then one may freely, if he choose, try massage, if no other contraindications are present; in particular, he may assume that it may prove useful in cases of insufficient secretion of hydrochloric acid.

Gastric Neuroses.—It is clear to every one who has had to do with gastric disorders, especially if they were neuroses, that it is not yet possible to determine with certainty the influence of massage on these still obscure forms of disease. We only know that kneading of the stomach, in certain cases of sensory disturbances, and probably in cases of motor disturbances also, has a favorable effect.

In the literature of the subject, we find many communications touching the favorable influence of abdominal-massage in nervous dyspepsia—the worth of which recommendations is a good deal reduced, by reason of the fact that the meaning of this uncertain expression is not specified.* I am myself inclined to the opinion that at present there is no one who can fully explain the distinctive influence of massage in cases of purely nervous dyspepsia. Dyspeptic symptoms, from which patients having habitual constipation often suffer, disappear as soon as the stools become normal. These cases of dyspepsia, however, are, in my opinion, never to be classed as purely nervous. However, among patients who have been subjected to the Weir Mitchell treatment with advantage, I have seen symptoms, of what seemed to me

* We may, as a beginning, distinguish, for the present, two principal tendencies regarding the meaning of the expression, "nervous dyspepsia." Some physicians, *e. g.*, Stiller, in Buda-Pesth, include under nervous dyspepsia not only the more subjective complex of dyspeptic symptoms, but also every genuine secretory disturbance of digestion which depends upon nervous influence, or which may be supposed to depend upon such influence, among which is a too great or too slight formation of hydrochloric acid due to some unknown cause. Others, indeed, leave the original meaning of the word dyspepsia entirely out of account, and designate all sensory and motor disturbances affecting the digestion, as nervous dyspepsia. This is sometimes carried so far that, practically speaking, nervous dyspepsia means to them every gastric affection that is not cancer, dilatation, ulcer, or catarrh. Another, and more justifiable definition, according to my idea, is one in which the term nervous dyspepsia denotes, as it does with Ewald and Leube, a condition in which the patient is troubled with the ordinary dyspeptic symptoms (loss of appetite, a sense of pressure, tension, or pain in the stomach, languor after meals, etc.), although the gastric juice appears to be normal, according to our present ideas, and fulfills certain demands as to its composition and digestive power (according to the now generally known test of Ewald and Leube). Even when we have narrowed the limits of nervous dyspepsia in this way, it still comprises various forms of disease, which, so far as diagnosis is concerned, may well prove less puzzling in the future to gastric specialists than is now the case. If we use the term in a still wider sense, then it becomes as unsatisfactory as the old expression "gastric catarrh," which formerly, to put it summarily, meant everything that it possibly could mean, with the exception of cancer, ulcer, and dilatation; but which is only used now in those cases in which the amount of mucus is increased (after a little time), the content of hydrochloric acid is diminished, and the process of digestion becomes slowed.

purely nervous dyspepsia, abate; but many other important factors, besides massage, are involved in the Weir Mitchell treatment.* Concerning the massage-treatment of the other ill-understood gastric neuroses, we know next to nothing.

According to my experience, the extremely painful condition which is sometimes present in the case of neurasthenics, and which has been designated by some physicians as cramp of the stomach (*spasmus ventriculi*, or spastic cardialgia), quickly abates; at least that is frequently the case when frictions are made over the stomach, and that is the only gastric neurosis which we happen to be able to speak about with certainty.

It is also impossible to offer a satisfactory explanation of certain disturbances of sensibility that belong in this category. It is undoubtedly true, though, that patients thus affected are occasionally "cured" under abdominal-massage. But who is there that would undertake to determine how far the improvement was due to massage or to other factors in the treatment? In many cases these gastric "neuroses" depend upon neuro-pathic or psycho-pathic conditions of a general nature. Thus it is difficult indeed to determine the significance of hypochondriacal phenomena that are possibly present. Simulation,† more or less well marked, exists frequently in these cases, and external psychical influences that cannot be excluded with certainty, readily occur in addition, etc.

In a case of anorexia, I was compelled, so to say, by the patient to have recourse to abdominal-massage; and I have recently had occasion to employ it, experimentally, in a case of hyperorexia also. In both cases typical abdominal-massage was employed, though it consisted principally of energetic frictions, amounting almost to blows, over the stomach. I adduce accounts of the two cases, which are interesting in other respects also, leaving the reader to draw his own conclusions; and will confess that I am unable to reach any conclusion in either case with regard to the influence of massage upon it.

1. Mr. X., a naturalist, just entered upon middle life, who belonged to a psychopathical family, and who on closer acquaintance gave the impression of being "burdened with nervousness," came to Carlsbad on account of a gastro-duodenal-catarrh and its accompanying dyspeptic troubles, which, during his stay at the health resort, rapidly abated. Toward the end of his course of treatment, the patient was suddenly attacked with inability to use his legs. He had to be transported in a wheeled-chair, and also to be carried up and down stairs, and on this account was the subject of much sympathy. He presented absolutely no abnormal symptoms of an objective sort; and after a while, as I had expected, his unaccountable affection departed as quickly as it had come. The patient was at Carlsbad again the next year, but for no particular reason. This time, too, after a little while, the same powerlessness to use

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* The technique of massage, in the treatment of gastric neuroses, consists of the usual "abdominal-kneading," which has been described already. As is well known, Burckart has discovered sensitive points in nervous dyspepsia corresponding to the superior hypogastric-plexus, when pressure is made in the middle line, just below the navel, opposite the fourth and fifth lumbar vertebræ, and between the two common iliac arteries. Pressure at this point causes the patient pains that radiate in the upward direction (to the solar plexus and the pit of the stomach, and sometimes as far as the head and throat), to which Burckart ascribes a certain diagnostic significance. I have never meddled with massage over this point, but I call attention to it because an effect of the kind mentioned may be of some value, possibly.

† All possible transition forms exist between the severest hypochondriacal conception of coercion, and the purest form of simulation.

his otherwise entirely sound legs appeared. Late in the summer of that year, marked weakness of appetite developed, which soon assumed the proportions of a disturbing anorexia. In October the patient, who in other respects presented no unusual psychical symptoms, consulted me on account of his trouble. A tolerably searching examination disclosed nothing abnormal, except that the patient was very emaciated and had a pulse of forty-four, which, according to his report, had been much slower; and that, one hour after a test-meal, according to Ewald's method, which he consumed with great difficulty, the gastric juice contained only 0.11 per cent. of hydrochloric acid, which was less than the normal minimum. The urine was extremely saline, weighed 1,031, but contained neither sugar nor albumin. The patient declared that for some weeks he had eaten only a few tablespoonfuls of rice per week and had drunk a wholly insignificant quantity of water. This statement was corroborated by other persons, without the knowledge of the patient. The patient insistently demanded to be treated with abdominal-massage, which he had once previously received in London with good effect, as under it he had quickly improved and begun to eat and drink. After four days, the pulse, which was noted at the same hour each day, was sixty-four, and the urine had a specific gravity of 1,026. After a few days more, the patient became greatly alarmed, because I had a slight angina, and broke off the treatment for fear of contracting diphtheria. His consumption of food and drink was at that time nearly normal.

2. J. A., a shoemaker, twenty-six years old, presented himself recently, in February, 1890, at the Polyclinic for Gastric Diseases in Stockholm, complaining of a cardialgia of four months' standing.

There is an hereditary psychical taint in the patient's paternal and maternal ancestry. In his youth the patient was addicted to onanism, and lived an unhealthful "religious" life besides. The patient is much emaciated and says that during the last few months he has lost weight. The boundaries of the stomach are normal. One hour after the usual test-meal of tea and wheaten bread, the gastric juice contained 0.19–0.20 per cent. of hydrochloric acid, *i. e.*, a wholly normal amount of it. The patellar-reflexes had disappeared.* The patient was easily exhausted by walking; the pupils were large and somewhat inactive, otherwise there were no symptoms of tabes. The urine was normal in amount, somewhat thick (1.027), and contained, as is commonly the case with neurasthenics, in spite of an enormous ingestion of starch, only a trace of glucose.

The patient consumes in the morning 360 to 430 grammes of wheaten bread, with the appropriate amount of butter, and almost a liter of milk. At mid-day he eats heartily of meat, with half a dozen whole potatoes, and about 200 grammes of bread. At evening he takes something more than 300 grammes of bread, with milk and butter. Between meals he occasionally eats something, usually bread. The patient declares that his thoughts continually dwell upon eating, and that he dreams of it at night. As one can see, the ingestion of carbo-hydrates, in connection with a tolerable amount of fat and albumin, is abnormally increased. After a fortnight's abdominal-massage, during which the patient was sensible of a considerable improvement in his general condition, the hyperorexia for the most part disappeared, and the formerly enormous ingestion of carbo-hydrates was reduced to the normal or very nearly so.

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* The patient learned the meaning of the reflexes at the time of the examination, and declared that he had a brother in whom the patellar-reflexes were likewise lacking, but who was well in all other respects.

The patient's weight was not taken. Perhaps the patient might have been just as well cured, and more quickly, of his hyperorexia by means of "suggestion."

Inasmuch as my experiment with massage gave an evident, though not very clear, result, I sent the patient, for the sake of greater certainty, to a physician who had faith in hypnotism, and asked him to employ suggestion in connection with a rationally-ordered diet in which regard should be paid to the usual relation between carbohydrates, fat and albumin.

CHAPTER XVI.

DISEASES OF THE CENTRAL NERVOUS SYSTEM.

Difficult though it be, in the state of our present knowledge, to expound comprehensively the effect of massage in nervous affections of a peripheral nature (see pp. 102–114), it is very much more difficult to do so with regard to central neuroses, concerning whose treatment by means of massage our clinical experience is still very slight; therefore, the reader of this chapter will have to content himself with a superficial sketch of the subject. Just as, for a long time, orthopædic and gymnastic measures were employed in order to modify certain conditions resulting from central neuroses, and just as latterly the attempt has been made to modify these diseases by means of various kinds of stretching (an attempt which so far does not offer much promise), so here and there a beginning has been made to call massage to the aid of electro-therapy and hydrotherapy and the multifarious forms of internal medicines. This is particularly the case in diseases of the spinal cord; still there are changes of the higher centres, as we shall see further on, which are not wholly excluded from the domain of mechanotherapy.

In this field the technique varies to a very unusual degree. All the different "schools" agree in giving a prominent place to muscle-massage, which is executed in the usual manner by means of effleurage, pétrissage, and tapotement. This form of massage is applicable either to the groups of muscles that are especially affected by disease, or to extensive parts of the muscular system, above all, to the four extremities. Next in importance, stands general nerve-massage, the term being used in a rather limited sense, especially by the Swedish medical gymnasts. In using this form of massage, the attempt is made to act directly on a nerve trunk, more or less extensively by means of tapotement, or by other forms of manipulation (*e. g.*, nerve-vibrations and nerve-frictions) which are akin to it and aim at

causing stimulation. Comparatively infinitesimal importance attaches to the attempts which have been made to reach the nerve-centres themselves immediately, through one or another form of tapotement along the course of the spinal column, or by frictions over the plexuses in the abdominal cavity, both in neuroses and in other unallied diseases (see page 226).

Meanwhile, I admit that the nearest approach to a mechano-therapy of central neuroses, especially in neuroses of the spinal cord, is to be found at the Orthopædic Institute in Stockholm, where a considerable number of such cases have been treated in recent years by a highly-trained physician, who is familiar with both gymnastics and massage. The following exposition is wholly based upon what I have had the opportunity to observe and gather in that institution.*

Massage, as it is performed there, resembles the so-called general-massage in many respects; but it is naturally varied a good deal to meet the conditions which present themselves in the various forms of neurosis, in so far as the greater mechanical labor is devoted to the peripheral parts, which are the more liable to motor or sensory disturbances of the vaso-motor, or trophic sort. Though gymnastics, with passive and resistive movements, are always added; still, massage constitutes the principal factor in the treatment. The order followed in giving the movements and manipulations is a matter of no very great importance.†

In order to give the reader an idea of the mechanical treatment employed in a case of central neurosis, I will describe a part of the course followed in a case of tabes. Having followed this, it will be easy to understand, I think, what treatment should be employed in other cases.

The tabetic patient receives thorough massage of all his

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* Dr. A. Wide, the director of the Gymnastic Orthopædic (not the Gymnastic Central) Institute, in Stockholm, has willingly afforded me every opportunity to take part in his treatment of neuroses, and has shown and reported various cases to me that I recount below. Wherefore I take this opportunity publicly to offer my cordial thanks to him.

† Especial mention should be made of the fact that the massage manipulation in the Orthopædic Institute, where many persons are simultaneously treated by the very busy assistants, is usually made through the clothing, or, at least, over the shirt, whereby the influence of the effleurage and the nerve-vibrations is somewhat reduced. If the patient is treated at home, then the massage may easily be executed upon the body itself, which is obviously more advantageous.

extremities; effleurage, pétrissage, and tapotement being used. When there are lancinating pains the last named manipulation, or nerve-frictions, which are like it in effect, is executed over the path of the special nerve-trunks. When the girdle-sensation exists, or other sensory disturbances are present in the back, a manipulation approaching the character of a vibration is made over the appropriate part, in which case the hands of the masseur, with the tips of the five digits spread out like claws, work over the entire area under treatment without any attempt to follow special nerve-trunks. Then the masseur (at times over the clothing) makes "vibrations" with the tips of the middle fingers of both hands simultaneously, on both sides of the spinal column, in order to stimulate the nerves at their points of exit from the spinal column. Then follows massage of the abdomen, in the manner which has already been sufficiently described. Furthermore, massage of the bladder is performed in the following manner: the masseur lays the tips of the three middle fingers, of one or both hands, above the symphysis of the patient (who sits in front of him with his clothing unbuttoned), and then, while pressing directly against the abdominal wall, makes small, rapid vibrations upon the bladder. Then follow gymnastics, which, in the cases that I have seen, consisted chiefly, or almost exclusively, of passive movements.

It is clearly obvious, and particularly to be emphasized on account of its importance, that the amount of labor bestowed upon the patient is relatively very great. A good hour's work, with short interruptions, is performed by the hand of a well trained assistant,* and this form of treatment is frequently continued for months at a time, and not infrequently is repeated from year to year. There can be no doubt that it is to this continuance of treatment that we must look for the explanation of the results, which are often of an astonishing nature to those who *à priori* are not inclined to attribute importance to such treatment, especially in extensive central neuroses of a progressive nature.

Massage of the muscles serves the important office of maintaining the muscles in the best possible condition of nutrition;

* The more "difficult" and important manipulations, *e. g.*, massage of the bladder, abdominal-massage, and direct massage of the nerves, are only performed by physicians.

particularly when, in cases of central nervous changes, they are threatened with atrophy, partly from insufficient nervous impulses, partly as a result of their own inactivity. This is an office which this treatment often fulfils most admirably in that, when continued for sufficiently long time, it restores their functional power to muscles that appear to have lost all contractility and which have ceased to react under electrical stimulation. In certain processes in the muscles, whose essential nature is still unknown to us, as, for instance, in the remarkable affection called lipomatous pseudo-hypertrophy, massage can, so far as our present experience goes, accomplish nothing more than a temporary improvement, which is observable only during the treatment itself. As has been emphatically stated elsewhere, massage has the same influence upon smooth-muscle fibres that it has on the striated-muscle fibres. It is a noteworthy and important fact, in the treatment of neuroses, that massage exerts an influence upon the functions of the intestine; and I cannot doubt its influence upon the bladder after what I have seen in the Orthopedic Institute. In massage of the striated, as well as of the smooth-muscle fibres, the mechanical irritation of the peripheral nerve-trunks constitutes a factor which, though its essential nature is not well understood, is certainly of considerable importance.

We must assume (see page 78) that the last named form of irritation exerts an influence upon intermediate and central nerve-centres through unknown molecular effects in the corresponding nerve-trunks. Its influence upon the centres is probably of such a nature that it can act favorably upon disturbances of nutrition, and possibly overcome such as are not very profound; or it may, when certain nerve-elements have been destroyed, be able to facilitate the vicarious action of other nerve-elements in their stead.

It is no longer possible, in the light of the experience which has been gained in this matter, to doubt the influence of massage upon certain symptoms arising in nervous pathology, which symptoms, in some cases, undoubtedly depend directly upon central changes. In a case of tabes, which is described below, we shall see that disturbances in the co-ordination of movements (ataxia) were certainly influenced by means of long-continued and energetic massage, which fact agrees with what had been observed before in another field. In the case in question this

influence manifested itself to a striking degree upon the so-called Romberg's symptom.

At any rate we are in a position to express an opinion, though the matter is still far from being fully elucidated, concerning the effect of massage upon various forms of cramp, which belong to motor affections, that are modified by means of massage. We received a hint as to this, long ago, in the circumstance discovered by Frey, that those remarkable "saltatory" attacks of cramp which depend upon clonic reflexes can be stopped by means of pressure upon the corresponding muscles, which may have some analogy to the observed fact (see page 59) that one may by means of static pressure upon motor nerves cause other more accidental forms of cramp to disappear. Furthermore, it is certain that the involuntary movements in chorea, and the tremor which accompanies some forms of metallic poisoning, etc., can be modified by means of mechano-therapy, and especially by means of massage alone.

Reports have already been made by different authors, Türk, Schreiber, Hünerfauth, Granville, Zabludowsky, Douglas Graham and others, that certain disturbances of sensibility in cases of central neurosis, especially anæsthesia, hyperæsthesia, paræsthesia, and lancinating pains, have been improved or abolished by means of massage; and by reason of the information communicated to me by the physicians and patients of the Orthopædic Institute in Stockholm, I believe we may concur with their statements.

However, there remains much to be done by way of accurate investigation in this field. Concerning other sensory disturbances, such as analgesia and changes in the rapidity of the transmission of stimuli, we are still completely in the dark. Similar uncertainty rules in regard to a not unimaginable influence of massage upon the reflexes.

Concerning the influence of massage upon vasomotor and trophic disturbances, I have nothing to add to what has been said already in Chapter III.

Nutrition, sleep, appetite, and the whole general well-being is improved by means of massage-treatment in the case of central neuroses, even as elsewhere.

As a general rule, in cases of acute neuroses, recourse is first had to massage after the completion of the process, and during

the condition that follows it. In chronic neuroses, on the contrary, massage is employed during the greater part or the entire course of the disease.

From these general remarks, whose incompleteness I regret, but cannot help, I pass to some particular remarks and the consideration of some cases of different diseases of the spinal cord and the higher nerve-centres. I repeat once more my "*ceterum censeo*," which may be monotonous but is not unjustified, *i. e.*, that massage in these cases, also, is not a method but a means, which does not exclude other means of treatment, be they of a mechanical nature or not, but should be employed simultaneously with them.

Diseases of the Spinal Cord.—The diseases of the spinal cord in which massage has already been proven to have a more or less favorable influence, or in which we may assume with right that it has some worth, are the following: conditions resulting from concussion, traumata and bleeding, chronic myelitis, and myelitis from compression, tabes dorsalis, and hereditary ataxia, multiple cerebro-spinal-sclerosis, spastic spinal paralysis, amyotrophic lateral-sclerosis, progressive muscular atrophy, acute anterior-poliomyelitis (after the completion of the inflammatory process), paralysis after acute diseases, *e. g.*, after diphtheria, toxic paralysis, co-ordinative neuroses due to certain occupations, primary muscular spasm, tetanus, and saltatory spasm.

I adduce the following case of *commotio medullæ spinalis*, which I myself observed during its treatment under Dr. A. Wide's supervision at the Orthopædic Institute:—

A man, thirty-one years old, was injured on January 10, 1888, in a railroad accident in Bradford, Mass., and in a senseless and damaged condition was taken to a hospital in Haverhill. The case showed the usual acute symptoms. When these had passed, there remained a pronounced paresis of the left leg as well as some sensory disturbances. The patient underwent treatment for a year and a-half in America, concerning which I (Kleen) could only learn, on account of the unusually settled principle of the patient to give an answer to imaginary questions but never to those actually put to him, that it yielded no improvement. On October 19, 1889, his treatment, by means of massage and gymnastics, began in the Orthopædic Institute, in Stockholm. The patient, on account of the paresis of his left leg (which by measurement was 2 cm. shorter than the right), was entirely unable to walk without assistance. He suffered from severe pain in the back and from a periodically-recurring girdle-sensation; and from palpitation of the heart, shortness of breath, sleeplessness, and general nervousness besides. In place of the hitherto stationary condition, a

rapid improvement now set in. When, on December 18, the treatment was interrupted for a considerable length of time, the patient could walk without aid, and the leg had become very much stronger. At the present time, March, 1890, both legs have about the same thickness; the patient walks well without support, though weariness sets in pretty soon in the left leg, on account of which inequality in the gait then appears; the sensory symptoms have disappeared.

Hünerfauth and others report improvement by massage in cases of chronic myelitis. At the Orthopædic Institute, in Stockholm, massage has been used with success, in myelitis due to compression, in order to counteract muscular atrophy (the corset and other usual treatment being employed simultaneously).

Tabes dorsalis has been treated with massage by a considerable number of mechano-therapeutists. I confess that I have always looked with great distrust upon the favorable opinions which have been uttered concerning the results in this class of cases. I can, however, adduce a very remarkable case here, which was treated by massage, after the manner described in the sections of this chapter devoted to general considerations. During its entire course, the case was observed by Dr. Wide, as well as by several other physicians. I examined it myself, also, and it is pretty well known in this neighborhood. I do not adduce it as representing the usual course of similar cases which are treated in like manner. On the contrary, I believe that this case, as regards the *degree of improvement* which it showed, is a tolerably isolated one, in spite of the fact that many similar cases, under various forms of treatment, present long pauses and temporary improvement, as regards the course of the affection. Besides massage, passive movements and galvanization also were made use of. Still, the passive movements were certainly of comparatively slight importance; galvanization had been previously used, without any result to speak of, and during later years, in which the improvement was noticeable, it was not made use of. The case is, therefore, a tolerably pure experiment as to the influence of massage. A mistake in the diagnosis of the case is excluded, since it was examined at the very beginning of the treatment by various physicians, among whom was an extremely prominent nervous pathologist; and to-day, in spite of its unexampled improvement, there can be no doubt of its tabetic nature.

An officer in the Swedish army, thirty-two years of age, without any known syphilitic antecedents,* in 1878, became the subject of lancinating pains in the right hand, and in the following year in the right leg as well, and later in all his extremities. There was added to this condition the peculiar sensation of "cotton under his feet," and weariness in walking. In 1880 bladder-symptoms, with ischuria, constipation, and paresis of the sphincter appeared, and the patient's virility was diminished considerably. In 1884 his gait became ataxic, Romberg's symptom was very prominent; and the patient showed a pronounced and hopeless picture of a progressive tabes dorsalis.

In 1885 the patient (who had previously been subjected to electrical and balneological treatment only, and was then able to go about with the greatest difficulty, and for short distances only, inside the house), began to receive massage and gymnastic treatment in the Orthopædic Institute, in Stockholm; which treatment was continued every year thereafter, for two or three months. In the first year the patient was subjected, also, to galvanization, of an appropriate sort, of the spinal cord and the peripheral nerves; although this circumstance militates somewhat against the case as a mechano-therapeutical experiment, which, indeed, it was not considered to be. Meanwhile, as the patient himself laid especial stress upon mechanical treatment, he finally had a stop put to the electrical treatment; and, for the last few years, was treated exclusively by means of massage and passive movements. At the beginning of this form of treatment, the patient's condition improved so, from week to week, that it excited the greatest astonishment, not only on his own part and that of his friends, but also on the part of the physicians who examined him from time to time.

The intensity of the lancinating pains rather quickly became much less severe; the ataxia and the Romberg symptoms abated; the function of the bladder began to return; the movements of the bowels became more normal; and the patient's virility returned, much to his satisfaction. The patient was in a condition to serve again with his regiment. In the summer of 1888 he participated in short field-manœuvres, during which he marched, on one occasion, nearly thirty kilometers in a single day, without showing marked effects from it. During the past winter he has taken a very active part in the social pleasures of the capital.

When I saw the patient in March, 1890, his gait was quick, but showed now and then a slight deviation from a straight line, which was scarcely noticeable except to a close observer. The Romberg's symptom appeared to be very slight in its manifestation, and the patient can walk through the room very well with his eyes shut; the lancinating pains occur only after excesses; the sensation of "cotton under the feet" exists to some degree; bladder and rectum functionate almost normally; and the tendon-reflexes are absent. As to the eyes, whose condition was never bad, the only noteworthy fact is that the left pupil is considerably larger than the right and reacts very badly, though perceptibly. Acuteness of vision in the eye in question scarcely amounts to 1.0 though it is more than 0.9. Close examination by Dr. Nordenson, which, however, on account of the patient's lack of time did not include a perimetrical investigation of the field of vision, yielded a similar result. In particular, the fundus of the eye on both sides showed nothing abnormal.

Henschen attempted mechano-therpeutical treatment in ordinary tabes, but does not report what form of treatment he employed or how much labor he expended on it. He remarks, however, that in the related ataxic paraplegia with heightened tendon-

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* The patient had never been subjected to any anti-syphilitic treatment whatever.

reflexes good results may be attained thereby. (See Förhandlingar vid mötet i Norrköping, 1887, p. 115. Proceedings of Congress at Norrköping, 1887, p. 115.)

Hereditary Ataxia.—"Friedreich's Disease" has been subjected in four cases, to the above described treatment for tabes, by Dr. Wide. In case of a brother and sister (fifteen and twenty years old respectively) who were subjected to this treatment, for a few months in 1886 and again in 1887, a clearly perceptible improvement was attained, in so far as the ataxic disturbances in speech and gait were diminished and the irregular action of the heart was rendered more equable. After the close of the treatment the condition was again very much what it was before. The other two cases, who were children of the same parents, were treated for a month without any improvement to speak of.

The treatment of *multiple cerebro-spinal sclerosis* resembles that of tabes, and may likewise in some cases lead to improvement; such was the result in two cases treated by Dr. Levin, of Stockholm.

One case of *amyotrophic lateral sclerosis* has been treated by Dr. Wide, who makes the following communication in regard to it.

A woman, twenty-five years old, suffered, in the spring of 1888, from atrophy of the right arm, which developed so very quickly that in the course of two months the arm became two centimeters smaller in circumference than the left. The muscles of the hand were the more severely attacked, so that the thenar, hypo-thenar and the interosseous muscles were reduced to a minimum. After a little, the movements of the arm were so weak and those of the hands so badly executed that they were unequal to any labor, and the patient was unable to open a door with the same, or button his clothes or tie a knot. The left arm remained sound. The legs, on the other hand, soon began to participate in the diseased process. The patient quickly tired from walking; had the sensation as if his legs would not support him; and staggered slightly. The patient stated, too, that he saw a yellow mist with one eye and a blue mist with the other. Acuteness of vision was not reduced.

During the spring of 1888, the patient was treated with electricity, baths, and massage of the right arm. Wide's treatment began in the middle of October, 1888. The patient now received massage of the right arm * and of both legs; he was also given general gymnastics; all this continued daily for two months. The further development of the process in the right hand gradually ceased; indeed, a slight improvement was perceptible. The legs became essentially improved, and, with the exception of the quick onset of the feeling of weariness in them, they ceased to present objective symptoms. In January, 1889, the same sort of treatment was again begun and continued until the end of May. The improvement of the hand and arm during that time was noticeable; and the patient began to use his arm again for practical purposes, and even to play the piano. The treatment is still continued, and is characterized by progressive improvement.

So far as I know, spastic spinal paralysis, *tabes dorsalis spasmodica* (in which the lateral columns are concerned, either pri-

* In regard to the influence of radial-irritation in this case, see note on p. 104.

marily or in the course of other diseases of the spinal cord) has not been treated by massage. Nevertheless, by reason of the results of such treatment in lateral amyotrophic sclerosis, we may infer the probable value of this form of treatment in spastic spinal paralysis.

So far as the technique and the results of treatment are concerned, the treatment of *progressive muscular atrophy* corresponds to that of tabes. It is only through energetic and long-continued treatment that any considerable improvement can be effected in progressive muscular atrophy.

Wide secured an extremely satisfactory result in the case of a merchant in Stockholm, aged twenty-five years, in whom the atrophy of all four extremities was so far developed that the patient could walk with difficulty only, and could do very little for himself. After six months' treatment, in 1886, he was able to resume work in his counting-room. After that, his condition, on the whole, was stationary. Latterly—at least, until 1890—some slight further improvement has been attained.

In my own practice, I have seen the nutritional condition of the muscles maintained and to a certain extent improved, in a few cases. I have particularly noticed that massage is able to exercise a beneficial influence upon impaired muscular function; where at first one is inclined to make a diagnosis of progressive muscular atrophy, though, in the course of a considerable number of years, the process becomes limited to a small group of muscles.

That rare affection, known as *lipomatous pseudo-hypertrophy of the muscles*, which I bring forward in this place in spite of the still unsettled dispute as to its pathological nature, has sometimes been subjected to massage-treatment. There is in Upsala a case of this sort, which is one of long standing, and has served, year in year out, as an object for the aspirants to medical degrees in that place to exercise massage manipulation on. So long as the patient was subjected to this treatment the functional power of the various degenerated muscles was perceptibly increased; but it diminished again as soon as the treatment ceased.

Often in acute anterior poliomyelitis in children, or, in rarer cases, in adults, massage of the muscles has a part to play in after treatment, which, though it may last for several years even, results more satisfactorily than we should expect, when combined with electrical, orthopædic, gymnastic, and other necessary forms of treatment. The sooner, after the completion of the inflammatory process, massage is begun, the greater will be the prospect of our being able to maintain the muscles and other parts in a condition of tolerably good nutrition, and to prevent or limit the development of deformities; wherefore, the treatment exercises a very important prophylactic influence in this connection. It is only later, when the muscles have been in some

measure restored, as regards their power of contraction, that gymnastics can be added to advantage. Concerning the necessity of maintaining a rational balance between massage and gymnastics on the one hand and orthopædics on the other, see p. 74.

I adduce one of Wide's cases here, which is that of an adult man.

A man of about forty years of age, in April, 1889, during the night, was attacked by muscular paralysis, which became very well marked in the course of a few days. A little later it diminished and became stationary in both legs and the left arm; and paresis, in addition, showed itself in a part of the musculature of the left shoulder. It was quite impossible to move the left leg; the right could only be slightly flexed at the hip-joint, while there was no power of movement in the arm worth speaking of. Besides this, a degenerative reaction had begun to show itself in a part of the muscles, when massage and gymnastic treatment was begun, at the end of six weeks from the attack. After massage, for one and a half hours daily, had been continued for three months, the patient could walk with assistance, and the left arm had almost completely recovered its power of movement, while the right leg had recovered its power to some extent. Treatment has been continued with slight interruption, until the present time, February, 1890. The patient now walks very well without assistance. but with a perceptible paresis remaining in the left leg.

As to the relation of massage to paralysis, after acute infectious diseases, the same may be said that has been said concerning the conditions which persist after poliomyelitis. The treatment often yields good results.

Toxic Paralysis.—In all paralyses of a toxic origin, massage may be added to ordinary forms of treatment as a rational means of help, though hitherto it has been almost entirely overlooked by the medical handbooks. However, it often performs good service, and is now employed in many places, particularly in the tolerably frequent cases of lead poisoning. Various reports have been made upon it by Berghman, Helleday, Hünerfauth, and others.

Co-ordinative neuroses, due to special occupations, are characterized by spastic, tremor-like, or paralytic disturbances, which arise in groups of muscles that may be few or many in number, generally from strenuous, long-continued or one-sided labor of the upper extremities, more seldom the lower, and without doubt, in a portion of the cases, proceed from chronic inflammatory processes in the muscles or nerves of the extremities. (See, for instance, Henschen's case, p. 96.) In other cases there is not the slightest indication, and never in the form of sensitiveness to pressure, of such or other forms of peripheral changes. When, in addition, nervous, hereditary, and purely psychical influences

play an evident ætiological part, so that disturbances of nutrition at times manifest themselves in other distant groups of muscles, *e.g.*, those of the eye, the tongue, or the larynx, and are united with sensory symptoms, then we may rightly consider a part of these cases to be essentially central neuroses. At the same time, we must never leave out of sight the possibility of the existence of a peripheral pathological basis, and must seek for it in every case by means of an accurate palpation over every nerve and muscle which might be involved. So far as the muscles are concerned, we must usually be contented with the hint which is given by their sensitiveness to pressure.

It is well known that almost all persons who are obliged by their occupation to work chiefly with their extremities are subject to the co-ordinative professional-neuroses. Clerks, those who play the piano, organ, violin, zither, harp, etc., tailors, shoemakers, smiths, masons, sawyers, weavers, watchmakers, typesetters, draftsmen, cigarmakers, laundresses, telephone-operators, masseurs,* and others, all show similar symptoms; wherefore the old name graphóspasm is a less rational designation than the term "professional-neurosis," now in common use, which was proposed by Benedikt. In all these workers with their arms, it is preferably the muscles of the hand and the flexors of the forearm which are involved in the tonic cramp, the tremor, or the paresis; still the whole musculature of the arm, as well as the muscles of the shoulder, the throat and the chest, may participate therein. Among dancers the muscles of the great toe are those chiefly attacked, and among velocipedists the muscles of the thigh.

The extremely important rôle of massage in the therapy of professional-neuroses is now generally recognized.† Almost everywhere it forms a part of the treatment of such affections, together with the likewise extremely important resting of the muscles concerned from every form of strenuous labor, and in conjunction also with the galvanic current, which is applied both to the muscles and peripheral nerves and to the brain and spinal cord. This form of treatment is, moreover, called for by the general indications of the case. Many make use of gymnastics in addition. I will not absolutely dispute the correctness of such a course; nevertheless, inasmuch as rest of the muscles

* A. Wide, in a paper before the Swedish Association of Physicians, has given an account of the part played by the last two classes of professionals in this contingent.

† It is a consolation for one of peaceful disposition to know that a selfish priority-strife in regard to the massage-treatment of co-ordinative professional-neuroses is a hopeless undertaking. Priority in this field dates from a period at least as remote as the time of elder Ling's activity, and whoever would continue the search into earlier times would meet with the same fate that Hyrtl ascribes to Descartes, who sought for the human soul in the pituitary gland.

is recognized by all as having a favorable influence, and inasmuch as massage, in connection with the inevitable and necessary movements of daily life, is more than sufficient to prevent all changes from inactivity, I have never included gymnastics in the treatment of these cases.

The technique consists of vigorous effleurage over the course of the veins over the whole arm; and of massage of all appropriate muscle-groups by means of pétrissage and tapotement. I am accustomed in all such cases to employ tolerably vigorous massage. Some authors, Eichhorst, for example, prescribe "cautious," *i. e.*, weak massage. Hünerfauth employs more vigorous manipulations in spastic and paretic forms, and lighter manipulations in forms characterized by tremor. Some masseurs work especially upon the nerves, so far as they are accessible.

All this holds good, whether anatomical changes can be observed or not. When they are evident, the treatment should, of course, be directed exclusively, or for the most part, against them.

Almost all who have written upon massage have expressed their views with regard to the prognosis of such cases; and it is due to the vagueness with which men express themselves, as well as to the almost universal tendency to set forth the result of one's own labor in the best light possible, that we are still far from having trustworthy statistics in the matter. In order to give Wolf, the writing-master (who has made a terrible ado over his treatment of these cases, and boldly laid claim to priority, so dear to many, although his activity belongs to the seventies and eighties), an opportunity to speak a word here, I notice that in 277 cases he had 157 "cures," and that 22 were improved and 98 unimproved. My own experience, which has been limited to one and another case each year, and, as a whole, certainly does not include a tenth part as many cases as does Wolf's, only gives me the right to be astonished at his large number of "cures," in comparison with the small number of cases that were improved. His figures, which indicate the number that were unimproved, strike me as disproportionately large. We shall find that most cases, especially when rest and the galvanic current are included in the treatment, seldom show no result. In the majority of cases, however, we are not justified in estimating that result to be more than an improvement, at least in those

cases where evident changes cannot be made out. If one finds such cases, then we may form a more favorable prognosis. The treatment continues frequently for months at a time.

In the rare primary spinal muscle-spasm (Thomsen's disease, *myotonia congenita*), which is often hereditary, Erb recommends the use of massage, together with baths, electricity, and gymnastics. In the remarkable attacks of so-called saltatory cramp, which are probably due to the increased reflex-influence of the ganglia of the anterior horn of the spinal cord, a similar experiment is allowable, inasmuch as Frey has shown that we can put a stop to the cramp through pressure upon the muscles, and through simultaneous pressure upon the nerves.

Finally, it is not wholly unlikely that at least some forms of tetanus may be influenced through massage, in the intervals between the attacks, or possibly even during the attacks.

Since we now come to the consideration of those neuroses which concern the higher nerve-centres, I will remind the reader of the depletory influence of throat-effleurage in traumata, œdema, or hemorrhage within the underlying vascular domain.

Chorea.*—Most of my readers have made the reflection many times, doubtless, that the number of measures commonly made use of in the treatment of any given disease, is usually in inverse proportion to the efficacy of such measures. In order to find a remedy for chorea, mankind has had recourse to the greater part of its pharmacopœia, and to many remedies besides, some of which were otherwise unknown to medicine.† We are still far

* I refer here exclusively to the usual form of chorea—"chorea minor"—be it one-sided or double-sided, and leave entirely out of account the motor-symptoms, which occur in pronounced psychoses, hysteria, simulation, etc., which are usually called chorea major.

† In Nebel's "Die Mechanische Behandlung der Chorea, Wiesbaden, 1888," we find the history of the therapy, applicable to these cases, set forth with the thoroughness usual to that author. If we leave mechano-therapy and some few other means out of account, we receive a rather gloomy impression as to the lack of sound judgment in determining the treatment, as well as from the impotence of the treatment. Horrible Beelzebubs are raised, *e. g.*, daily chloroform-narcosis, in order to exorcise a tolerably inoffensive devil. Still, whether one did this or took refuge in less harmful means; whether he forced tonics, excitants, sedatives, hypnotics, and narcotics, emetics, laxatives, etc., upon the poor children; whether one made compression on their carotids, or whether he bled them; whether he scourged them with nettles, bathed them in sulphur baths, or showered them with cold water; whether one blew trumpets before them, or thumped a drum, the patients, horrible to behold and to relate, went on with their tossings, grimaces, and convulsions as vigorously and as long as if they had been wholly let alone. On the whole, the mechano-therapeutists have been comparatively skillful and successful. In 1799 Erasmus Darwin suggested the mechanical treatment for chorea. The Swedish gymnastics, under the elder Ling, were also employed in chorea. Southam, in London, deserves honorable mention. In 1841 he suggested immobilization, alternating with passive movements, and easy gymnastics for after-treatment. In the fifties the treatment of chorea, by means of massage and gymnastics, became fashionable in France, through the efforts of Sée, Blache, Laisné, Becquerel, and others. In connection with other means, mechanical treatment is now common in medicine.

from being able to determine to what degree each single factor of the mechanical treatment contributes towards ameliorating or cutting short the course of an indeterminate chorea, which may last for weeks or years, which may disappear forever, or recur again and again, without our being able to give any thoroughly satisfactory answer to the question why it happened—leaving entirely out of consideration whether the disease occurs in connection with endarteritis or rheumatism, chloranæmia, hysteria, or pregnancy, or whether it occurs, as it usually does, in the earlier part of the second decade of life, or later on.

Meanwhile the mechanical treatment of chorea consists of immobilization, massage, and gymnastics; and it would not surprise me if further investigations should show that the therapeutical worth of these three factors corresponds to the order in which I have named them. I would call special attention to the fact that, thus far, the value of immobilization has been more fully demonstrated than that of either of the other procedures.* Immobilization may be secured by means of a plaster-of-Paris corset and of plaster-bandages applied to the extremities, which later give place to a capsule that is removed once or twice daily in order to facilitate massage.

Massage is clearly called for in order to counteract the prejudicial effects which result from concurrent immobilization of the parts; and to influence the anatomical changes which present themselves, no matter whether they are occasioned by the "muscular-insanity" or are the occasion of it. These changes have been characterized by Elischer as hyperæmia of the nutrient-vessels, hypertrophy of the interstitial-neurilemma, obliteration of the contour of the medullary-sheath and the contour of the axis-cylinders, in addition to a patent macroscopic abnormal appearance of the nerve fibres, which are "faint in outline, smooth, and abnormally coarse-looking, from their dirty gray color."

So far as gymnastics are concerned, many will agree with

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* Nebel mentions: 1. That there is a note in the Journal für Kinderheilkunde, Bd. XXXIII, p. 137, concerning a Berliner, who immobilized the legs of his choreic child by means of splints, and thereby quickly effected a cure.

2. Monohan quickly cured a few cases by means of immobilization.

3. Nönchen, in 1885, cured a severe case in the course of a few days by placing almost the entire body of the patient in plaster-of-Paris.

4. Nebel, himself, by the same means, also cured a case in the course of a week.

Ziemssen's view, that they properly belong, at least in severe cases, to the subsiding stage of the disease. It is clear that they should consist of passive and gradually increased resistive movements, in which, beyond question, the movements are most easily brought under subjection to the will. Free active movements must be postponed until convalescence is well advanced.

In severe cases of chorea, then, we shall do best to immobilize and massage the patient for a short time (during which period most importance is to be attributed to the manipulations executed upon the extremities, especially to a vigorous effleurage), and thereafter to employ cautious gymnastics, gradually increasing in force, with passive and resistive movements. At the same time we ought to apply a weak *descending** galvanic-current to the spinal cord and the peripheral nerves; control the bodily and mental diet; and in addition give heed to the indications arising from ætiological factors, such as chloranæmia, peripheral irritation of one kind or another, etc.

Hünerfauth reports good results from the massage-treatment of athetosis, following encephalitis; and mentions the attempt made by others (by whom?) to treat paralysis-agitans in the same way. (See l. c., p. 152.)

Hysteria.—Massage has been used in this protean form of disease, usually in connection with gymnastics, and its legitimacy has been recognized by Charcot, among others. After what has been said already in that part of this chapter which is devoted to general considerations, there is little to add in regard to the massage-treatment of hysterical patients. The technique is of the same nature as that which was described under general-massage. The massage should be given by a properly instructed person, of the same sex as the patient; and it is better that the patient should be kept in bed. Modifications of the treatment, which may depend upon sensory or motor disturbances, on various conditions of the digestive apparatus, etc., will readily occur to all, from what has been said previously. On account of the character and nature of the disease itself, as well as from the lack of purely therapeutical experiments with massage, no one is in a position to express a positive opinion concerning its

* I am reminded of the observations of Legros and Onimus upon the diminution of involuntary movements under the descending-current, and their increase under the ascending-current, in the case of choreic dogs.

worth in the treatment of hysteria; still, in spite of this fact, the same effect from mechanical treatment is sometimes observed on particular symptoms of this disease as in neuroses whose pathology is understood. It is evident to every one that this branch of therapy can never become an independent principal factor in the treatment of hysteria.

Neurasthenia.—The massage-treatment of neurasthenia also consists of general-massage, with such modifications as the nature of individual cases may demand; and that is all we can say to the reader without wearying him by too much repetition. Nevertheless, I must consider in this connection a special therapeutical system that has been originated in our own day, which is intended for and thoroughly well-adapted to the wants of a numerous class of patients that we may call hysterics or neurasthenics. I pass now to a consideration of the "Weir Mitchell-treatment," which in my opinion is of great practical value.

*The "Weir Mitchell-treatment"** consists of rest in bed, isolation, fattening or plenteous nourishment, and the use of massage and electricity.

These different factors differ widely as to their purpose. The most important of them are: rest in bed, prescribed diet and massage.

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* Professor Weir Mitchell, of Philadelphia, has the honor of having devised this ingenious form of treatment, which is called after him by a great multitude of physicians. However, as there are always people upon the earth who can scarcely endure to have others highly honored, even rightly, various objections have been advanced even against Professor Weir Mitchell's claims to priority in this matter. These people say that no part of the treatment is new—neither the electricity, nor the massage, nor the fattening, nor the isolation, nor the rest in bed. Indeed the latter, say they, was used by Professor Sam Jackson, in Mitchell's home-country for exactly the same class of patients that are now subjected to the Weir Mitchell-treatment. This is all true, to be sure, but it has nothing whatever to do with the fact that Professor Mitchell was the first to combine the different factors of the treatment so as to form a systematic whole, which is admirably fitted to meet the demands of a particularly numerous class of patients of our day. To deny to the famous physician of Philadelphia the honor of inventing this treatment is just about as unjustifiable as if one should deny to the discoverer of gunpowder (who by the way was not Friar Schwartz), the honor of his discovery on the ground that sulphur, saltpetre, and charcoal were known before his day. Furthermore, it is quite in order that this treatment should have been discovered in the United States, because, although those who stand in need of it are tolerably numerous even here in Europe, still city-life in North America engenders a far larger, in a word, a terrible army of such persons among the choleric Americans. Professor Weir Mitchell's work, "Fat and Blood," caused an enormous sensation in the United States. It has been translated into various languages. The German translation bears the title: "Die Behandlung gewisser Formen von Neurasthenie und Hysterie, Berlin, 1887."

Since these factors are used in conjunction with one another, and since massage plays an important part; I will give here a somewhat detailed account of this form of treatment in its entirety, as I have a certain predilection for it.

We will remark forthwith that the treatment is intended for emaciated patients, especially for those whose weight has declined below the normal, and very frequently, besides, for patients who are anæmic, "run down," neurasthenic or hysterical. We are all familiar with this type of patients, which is frequently represented by persons who have experienced long-continued disturbance of digestion, or other weakening diseases. Still more frequently, we find the type represented by persons who, without having experienced any clearly marked disease, belong to the numerous victims of the enervating influences entailed by modern civilized life, especially life in great cities, with its intellectual and physical strain in the struggle for existence or social position.

It is self-evident that a form of treatment which demands so much sacrifice should be prescribed in pronounced cases only. It will not do for us to put every one who has not strong nerves, and is lean, to bed for weeks at a time, to fatten him, knead him, and subject him to all the manifold procedures of such a cure.

Weir Mitchell has employed the treatment chiefly for female patients. Still, as is easily apprehended, the same form of treatment may also, when the cases are well chosen, prove admirably adapted to male cases; most of my own cases were such.

The indications for the treatment cannot yet be said to be completely determined. It is possible that, in the future, they may in certain directions be extended beyond the limits which their gifted discoverer at first laid down. On the other hand, it is my belief that these limits, from the very beginning, embraced somewhat too much, in a certain direction.* Contrary to Weir Mitchell's doctrine, I never make use of this treatment for neu-

* I should state here that I possess and have read only the fourth edition of Weir Mitchell's work. I hear that at least one, perhaps two, later editions have been published, which, unfortunately, I cannot procure before this work must be completed. It is quite likely, then, that Weir Mitchell has changed his views concerning diet and the indications for his treatment, of which I present a condensed summary in this work. It is, however, of little importance whether this is so or not, since my special reason for the objections which I have stated is due to the fact that various physicians here in Europe continue to follow all the rules which were laid down by the renowned North American physician and which are perhaps still laid down by him.

rasthenics that are corpulent. Indeed, rest is a factor which promotes corpulency to a high degree. Weir Mitchell himself is obliged to modify his treatment in these cases in so far that immediately, or after a short time, he places the patient upon an exclusive diet of skim-milk, whose amount often sinks to about a liter daily. When we bethink ourselves that the normal daily nutriment of a man, engaged in moderate labor, comprises 120 grammes of meat, 60 to 90 grammes of fat, and 450 to 500 grammes of carbo-hydrates (the more fat the less carbo-hydrates, and *vice-versa*), and that unskimmed milk contains about 3.5 per cent. of albumin, 3.5 per cent. of fat, and about 5 per cent. carbo-hydrates, it is easy to see that such a diet (on which I shall have more to say later on) is not only not a fattening-treatment, but is certainly, for a resting person, a genuine famine-treatment. Indeed, the patients under such treatment grow thin, within certain limits, in spite of the continuous rest. It is difficult to imagine that such a diet can be adhered to without occasioning a loss of strength, even when the loss of flesh takes place gradually. Anæmic persons, who not at all infrequently may be very corpulent, must become more anæmic, and neurasthenics still more nervous, on such a diet; although their condition in these respects is less obvious during their rest from exertion, and is counteracted by means of the other factors involved in the treatment. Moreover, the defense of such a diet derives no support from the fact that, after it is completed, we allow the patient a mixed diet and give preparations of iron. For my own part, in the treatment of corpulency, which I have regulated and carefully watched in a great number of cases, I am accustomed, being led thereto by experience, to consider the most advantageous loss of weight for patients to be that which may be attained through bodily exercise. In connection with bodily exercise, I always employ a cautious, never excessive, though carefully-regulated, limitation of fat and carbo-hydrates,—under accurate control as to the bodily strength, cardiac activity, etc. Consequently, I never forbid bodily exercise to corpulent neurasthenic patients, be they anæmic or not, since that would promote their corpulence; and I do not place them on restricted diet, because I have often observed that they are thereby rendered more nervous. I think a better way to meet the needs of the nervous systems of such persons would be to remove them

from enervating social and family influences, by sending them to hydro-therapeutic, maritime or Alpine health-resorts and using such other means as we have at command, rather than to subject them to the Weir Mitchell-treatment. Those cases of fat neurasthenic patients that I have seen treated by other physicians, according to the last-named method, have not caused me to change my conviction regarding this matter. The results are absolutely different from those which one gains from the similar treatment of thin patients, or, best of all, emaciated patients.

Weir Mitchell, taking warning from some unsuccessful attempts, holds that his treatment is not adapted to persons who are suffering from pronounced melancholy; and Goodell and Playfair agree with him on this point. The kind of melancholy and the individuality of the patient, on the one hand, as well as the manner in which the different factors of the treatment, especially isolation, are managed, on the other, may, perhaps, be of influence here. On *à priori* grounds we might think that the treatment would yield good results in some of the lighter forms of melancholy.*

All may agree on one point, viz., that the treatment yields its best results when it is employed for thin persons, especially for those whose weight has sunk below the normal.

The patients under consideration are exhausted and lean. The distinctive aim of the treatment is, then, to afford them rest and fat.

Lying in bed affords the most complete rest that the patient can have, not only for his muscles, but also for his mind and spirit. It frees him from the manifold and changeful impressions and sensations which he is subject to so long as he continues to move about; and, furthermore, it puts him in a position to store up fat that would otherwise be expended on the maintenance of bodily movements. In many cases, also, it possesses the very considerable advantage that it makes the patient dependent to a wholesome extent on appropriate surroundings chosen by his physician, and renders the latter relatively independent of the patient, who is frequently quite insupportable

* How far this treatment should be extended to other neuroses must be determined by repeated investigations to be made in the future. In many cases it will probably prove beneficial, in connection with other agencies, for thin, choreic patients, for whose benefit it has already been tried.

and demoralized by reason of his neurasthenia or hysteria. As is very obvious, it is a highly essential part, a "*conditio sine qua non*" for the treatment.*

Lying in bed is to be interrupted only by a bath in the morning; by a visit to the closet, which must be near at hand; by the arrangement of the bed for the night; and by the weighing of the patient, which should take place once a week if so desired.

The aim of the isolation is to complete the mental rest of the patient, and is a matter of importance, which varies, however, considerably in different cases. The physician must attempt to obtain quick insight into the patient's nature, in order to do the right thing in this direction. One patient is extremely irritable and requires as complete isolation as possible; another, although in general as "nervous" a patient, is less irritable, and can quite well endure two visits daily from friends, especially when the latter refrain from speaking upon matters that concern the patient too closely, particularly about his disease. Some natures cannot endure long-continued isolation under any circumstances. As a rule, it must be firmly held that those whose intercourse with the patient should, first of all, be discontinued are the members of his own family. If, on the one hand, we must insist upon a certain degree of isolation; I am also convinced that by too pedantic strictness and insufficient individualization of the case, on the other, we may fail to secure the best possible results.

In connection with personal isolation, we must also consider what may be called intellectual isolation. The patient may read only for a short time during the day. If he suffers from asthenopia, as is not unusual in these cases, he should have a reader provided for part of the time. Newspapers are, in general, the most innocuous form of literature.†

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* Though rest in bed may be the most important part of the treatment, it is also incontestable that it is the most difficult part to carry out. The patients, who are frequently restlessly vivacious and, perhaps, in addition are accustomed to continuous distractions, easily revolt if mention is made of rest in bed for several weeks; and the most difficult problem for the physician consists in bringing them to the point of making such a sacrifice. It is my practice, having clearly pointed out to the patient the purpose of the proposed lying in-bed, to say to him that, if he cannot rigidly conform to it, it is not worth while to begin treatment. In order to facilitate complete resignation on his part, I am wont, under suitable circumstances, *i. e.*, in the presence of a reliable person having a good memory, to demand his word of honor that he will not break off this special part of the treatment within a definite interval. To lean women who long to take on flesh, the hope of attaining that end must afford a very considerable degree of constancy.

† Especially if they are of the same political stripe as the patient. I exact this as a condition in the case of Norwegians and Americans.

The diet should be designed to strengthen and fatten; consequently it should be copious in quantity, and provide, in proper proportions, the three food-stuffs, albumin, fat and carbo-hydrates. The food should be as easily digestible as possible, and should be ordered so as to tax the patient's digestive organs, or give rise to a disturbance of their functions, to the least conceivable degree. Milk does not possess this attribute when used as the exclusive nutriment of an adult person; leaving out of account the fact that a large amount of it is called for, if we would provide the normal amount of food for a moderately active man and a sufficient amount to fatten an idle one. It is true that milk includes all three classes of food-stuffs, but not in the normal proportions for an adult person. We see persons extremely often, furthermore, who under ordinary circumstances do not suffer from digestive disturbances of any kind whatever, who cannot bear a great amount of milk, whether it be mixed with other food or taken as an exclusive form of nutriment. Such persons develop pyrosis, eructations, disagreeable tastes in the mouth, coated tongue and constipation. An exclusive milk-diet is far from being the one which gives most strength, when the digestive organs are to be fully relieved of undue labor. He who has repeatedly had an opportunity to compare the influence of such a diet upon patients with gastric-ulcer with the effect obtained from a diet regulated according to the bill of fare laid down by Leube for such patients, which latter contains only such things as have been proven by exhaustive investigations to be most easily digestible, can scarcely escape the conclusion that the patients treated according to Leube's method are much better off than those who are condemned to an exclusive diet of milk. These and other reasons have determined me to depart from the diet which was used by Weir Mitchell and by many others after him.* Instead of that, I give a mixed diet which, if there be

* Weir Mitchell (according to the fourth edition of his book), in cases of neurasthenia in connection with emaciation (to which class of cases I for my part have limited the treatment) gives only milk (*e. g.*, 120 grammes every second hour); after a short period, mixed nourishment is given; after ten days the patients receive, thrice a day, 60–120 grammes of malt-extract, at every meal, in addition to the mixed nutriment. Besides this Weir Mitchell gives iron as soon as the exclusively milk-diet has been stopped; and in severe cases, gives cod-liver oil after the beginning of the third week, fifteen grammes after meals, by the mouth or in an enema. Later on, he almost always gives strychnine-sulphate with iron or arsenic. I have never employed an exclusively milk-diet except for patients having nephritis, where it may be of the

disturbed digestion, is made up exclusively of the articles admitted to the above mentioned bills of fare, devised by Leube for patients suffering from ulcer of the stomach.* Unskimmed, wholly fresh milk forms a part of it (in considerable quantities in those cases in which the patient can bear it); a certain amount being always given to the patient. In addition, the patient receives eggs, chicken, sweet-breads, pigeons' brains, hashed raw or half-broiled beef, or scraped roast beef, beef-steak, and venison. Good butter is likewise allowed in the great majority of cases. Carbo-hydrates are represented by wheaten bread, rice, mashed potato and macaroni. In proportion as the patient is free or becomes free from all dyspeptic or other symptoms relating to the digestive organs, the bill of fare is enriched with some other articles, such as fish, excepting salmon and eels, oysters, cooked fruit, etc. The patient receives food four times daily, at intervals of about four hours, as for instance, at eight o'clock in the morning, at noon, four o'clock in the afternoon, and eight o'clock at night. Milk is given in small portions throughout the entire day, both at and between the meals. The amount of nourishment may be so great if the massage, and especially if abdominal-massage, is given regularly and in the proper way, that it would constitute a copious dietary for a hard-working person. I have observed that patients, during this treatment, developed a much more vigorous appetite than they had previously possessed for a long time. The patients are allowed no alcoholic liquors at all, or only moderate quantities of Pilsener beer, red wine, cognac, or whiskey; the last two named are most frequently given in milk. Hitherto it has not been my custom to prescribe cathartics when employing the Weir Mitchell-treatment. If the abdominal-massage is thoroughly performed it is extremely rare that there is any need for prescribing them.

During the treatment the patient ordinarily sleeps well, even

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highest interest to us to protect the kidneys, and where we frequently attain excellent results with this diet, which results are easily explicable through the profound changes the urine undergoes. If, for example, I had a patient with subacute nephritis needing the Weir Mitchell-treatment, I would prescribe an exclusive milk-diet, which, as well as absolute rest, would increase my hope, to a considerable degree, of seeing the patient relieved from his kidney-trouble.

* While all these different things should only gradually be introduced into the diet of patients having gastric-ulcer; such patients as require the Weir Mitchell-treatment should take them altogether and in large quantities.

in those cases where he has been troubled with sleeplessness. At first, for the most part, I avoided all rest-giving remedies. Latterly I have used sulfonal, sometimes. The treatment permits the simultaneous use of iron, in consequence of the abdominal-massage. I am accustomed to vary the different preparations of iron as need may arise. Sometimes I have prescribed the admirable Levico water, which contains iron and arsenic; Roncegno is also good, though it varies a good deal as to the amount of its mineral contents.

The massage employed is the so-called general-massage (see p. 45). Its principal office in the treatment is to compensate for lack of bodily exercise and to prevent injurious effects which would otherwise arise on account of the patient's long-continued rest in bed. Rightly executed, under these circumstances, it has, as we should remember, a powerful influence, in that it quickens the circulation and the action of the heart, and acts as a restorative and tonic. Tapotement of the muscles keeps the muscles in a good condition of nutrition; abdominal-kneading increases the appetite, augments secretion, heightens the power of assimilation, and promotes regular defecation. In regard to the technique, there is nothing to add to what has been said on p. 45, except that kneading of the abdomen and tapotement of the muscles should be performed as thoroughly as possible. The latter manipulation should be executed with as much force as the patient can endure, so that he is not irritated by it or too unpleasantly affected by it, which limit naturally varies in a very high degree in different individuals. The head is always left undisturbed. The massage may be given with advantage twice a day, and must always be given at least once a day. It is best that each sitting should last three-quarters of an hour. It is seldom that the physician has time to give it himself; therefore, he leaves it to some trained person of the same sex as the patient. Still, the physician must control the massage, partly by interrogations regarding it, partly by watching it, and partly by the weekly weighing of the patient. If the increase of weight is insignificant, we should suspect some mistake in the diet or in the massage.

Electricity in the form of general faradization, with slow interruptions of the current, is used on account of its well known influence upon muscles and nerves, and its general tonic effect. If

one choose, he may first apply electricity to each of the muscles, and then place one pole upon the neck and the other, for about fifteen minutes' time, upon the sole of one foot, and then for a like period upon the sole of the other foot. The electrical treatment, according to Weir Mitchell's opinion, is the least important factor in the treatment. I arrived at the same conclusion, before I read Weir Mitchell's work, having tried his treatment several times, according to the generally known scheme that had been given out by him; since I always obtained admirable results with the treatment, without having for a single time resorted to the aid of electrical treatment in such cases.

I prescribe, instead, that the patient, as soon as he is awake, should take every morning a so-called sponge-bath, with moderately cold water. This consists of affusion by means of a large sponge. The temperature should preferably amount to 20 degrees Celsius, or more; and I am wont to explain to the patient that the temperature should be such that the water feels cool and refreshing, but not unpleasant. In the case of women, the treatment should begin immediately after a menstrual period.

I would set six weeks as the mean duration of a Weir Mitchell-treatment. Of these, five weeks should be passed continuously in bed; during the sixth week the patient should pass to a more active mode of life, and should be up or out of doors one or more hours daily.

"After-treatment" at the seaside, an Alpine health resort, an iron spring, or a cold water establishment, is often of great service.

I bring forward two typical cases here :—

1. H. S—n, an attorney, from Lavanger, in Norway, about 38 years of age, came to Carlsbad in the summer of 1887. The patient suffered from slight dyspeptic symptoms, but chiefly from a chronic colitis, with diarrhœa, which had existed for a few years. He had become quite thin therefrom, and was rather anæmic. The patient took Carlsbad-water in very small quantities, and daily had large injections, containing gallo-tannic acid, at first with opium. He became essentially improved, and went home after a treatment of five weeks. In the autumn, after the intestinal injections, which had been continued for a considerable time, ceased, the patient's bowels were quite normal.

On the 8th of May, 1888, the patient appeared again in Carlsbad, although I had told him that he had nothing to seek there. During the winter the patient had done double duty, and now complained of great exhaustion, constant weariness, headache, a "feeling of emptiness," and inability to work. When, during the consultation, the patient would describe his troubles, he was completely overcome. Examination dis-

closed nothing in particular, except the ordinary anæmic symptoms. His digestive apparatus had long performed its function to the patient's satisfaction. The patient was rather small for a Scandinavian, and weighed, with his clothing on, only 50.50 kilogrammes.

The patient was advised to submit to the Weir Mitchell-treatment, and gave his word that he would stay in bed for at least five weeks. A large, airy room, whose window was kept open continually throughout the whole treatment, was found for him; and a good bed was provided.

The patient was allowed to write one letter a day, to read newspapers for a while, as well as to receive a visit from two of his countrymen, daily. The patient, on waking, took a sponge-bath and drank a small glass of Carlsbad-water. About eight o'clock he took two eggs, a few glasses of milk (from two liters of new milk which were furnished him every morning, to be consumed by evening), two wheaten rolls with butter, and some ham. At twelve o'clock he had a large piece of broiled beef, scraped fine, a portion of macaroni, and some bread and milk. At four o'clock he took dinner, consisting of a generous dish of meat, in the choice of which he was tolerably unlimited, but which was always accompanied by rice, macaroni, or mashed potatoes, and dessert, consisting of farinaceous food in some shape or a portion of stewed fruit, wheaten bread *ad libitum*, and a mug of beer. At eight o'clock he had a veal-cutlet, mashed potatoes, and some bread and milk. Of the latter he partook hourly during the day, a small quantity at a time, so as to consume the above-mentioned two liters before night.

The patient, who was horrified at the quantity he must consume when he consulted the bill of fare, nevertheless, in the first week ate all that was given him, experienced an unusual sensation of well-being, slept finely, and had a normal movement of the bowels every morning. He received massage, every forenoon, from a gymnast. At the close of the first week, that is on May 16, he was weighed in the same clothing and at the same time of day as before. He had gained 1.80 kilos, his weight now being 52.30. He was well satisfied and, on account of his good behavior, was much praised.

During the second week he had two rather loose stools daily, for two days. Otherwise everything was as before; but at the end of the week, on May 23, the patient weighed 52.80 kilos, having gained only 0.50 kilo, and was somewhat downcast. An investigation was now undertaken in order to determine the reason for this bad result. The patient was inclined to blame the four loose stools, but was not sure. The bill of fare was gone over, point by point, when it appeared that the patient had omitted the entire portion of meat at dinner—"he could have eaten it well enough but thought it would be too much," he said. The patient was recommended to turn his thoughts, in the future, in some other direction, and eat up what was prescribed for him. The massage, which a "chance call" disclosed to be very lamely performed, became essentially improved.

The next week everything went as it should, and on the 30th of May the patient weighed 55.50 kilos, *i. e.*, he had gained 2.70 kilos in seven days.

The patient (who, when he was weighed, always had the same clothes on, to the smallest detail, and was always weighed at the same time of day) and the one who weighed him, were both astonished at the result, which was accurately controlled and determined. The patient crept back to bed again extremely pleased with his vegatative triumph.

During the fourth week everything went satisfactorily. On June 5, the patient weighed 57.70 kilos, having gained 2.20 kilos.

In the fifth week the patient had to make a daily promenade. Being much occupied, I was not able longer to watch the case so carefully. On June 13, the weighing showed 58.40 kilos, or an increase of only 0.70 kilo. As regards his nervousness, the patient had made remarkable progress and was much gratified with his success.

During the sixth week the patient should have continued eighteen hours a day in bed; massage ceased and the stuffing was diminished. The patient, who had promised to continue this régime, but was anxious to go home to his family, thought he could not improve more than he had, and declared that he had suddenly received a letter which rendered his return home necessary, and took his departure several days before the close of the week. His increase in weight continued also during the latter days of his stay.

At New Years, 1889, I received a letter from the patient, in which he informed me of his happiness over his restored health, and overwhelmed me with expressions of thankfulness. The same thing happened again just before this manuscript was sent to press in 1890, and that in spite of my former explanation that the honor of the cure belonged to Weir Mitchell, in Philadelphia. Not a few physicians appropriate the praise from such patients, which properly belongs to the American professor. If one chooses his cases well, he will always reach more or less "brilliant," but surely satisfactory, results.

2. Baron von S., thirty-nine years old, was found to have albumin and epithelial casts in his urine, early in 1891. When he arrived in Carlsbad he showed symptoms of extreme nervousness and of overwork; his weight was much diminished; his urine was normal in quantity, with a specific gravity of 1.022, and contained something less than 0.5 part in 1000 of albumin, and showed epithelial casts and white cells.

The patient was kept in bed from July 8 till August 19. He took daily about 250 grammes of white bread, 3 liters of milk, and 3 glasses of Carlsbad-water, and was given general-massage once a day. July 8 he weighed 66.30 kilos, and on July 25 he had only increased his weight to 67.50 kilos. Except that the amount of milk was increased to 4 liters daily, the treatment remained unchanged. August 19 the patient weighed 70.70 kilos. He felt better, and was less nervous. The albumin decreased very quickly during the treatment, but a distinct trace was present up to the end of it.

A few of the still ill-understood diseases of the sympathetic-nervous system are affected to a certain degree by massage.

First of all, we are reminded of the possibility of causing an irritable condition in the sympathetic of the neck by means of frictions over the throat-ganglia. (See footnote p. 107.)

Wide massaged a case of myxœdema, in the years 1887 and 1888, for four to five months. The treatment consisted exclusively of general-massage administered daily for an hour at a time, since the patient could not bear gymnastics, which were tried at first. The patient, who was forty-eight years old, made perceptible improvement, both as regards her general condition and in respect to her diminished muscular strength, particularly in the back and in the upper extremities; and, in addition, the œdematous swelling which extended over the entire body disappeared during the treatment, only to return again later.

In regard to *hydrops articulorum intermittens*, see the case of Miss R. F., p. 155.

CHAPTER XVII.

GENERAL ANOMALIES OF NUTRITION—POISONING.

A. General Anomalies of Nutrition.

The influence of massage upon interchange of material and on general nutrition is, as yet, incompletely understood; still there are certain facts that support the inviting assumption that there is such an influence. Among the reasons for such an assumption are several of the peculiarities of massage mentioned in the third chapter, an especial reason being the influence which mechanical irritation has upon cell-life. Naturally, this does not hold to a degree worth mentioning, except as regards the so-called general-massage, which affects the greater part of the musculature of the body, and preferably should be combined with abdominal-massage (see p. 45). There is not much to say as to the influence of massage in most of the various diseases that belong in this section. With regard to corpulency, there is no need that I should add anything to what has already been said on page 50. I have no doubt that massage, by increasing the interchange of material, and by its directly mechanical effects, can contribute to the resorption of fat. Still, in gymnastics and dietetics, we have better remedies than massage for corpulent patients, and but few physicians would be inclined to add any other form of treatment in such cases.

Arthritis urica, if we may believe Hünerfauth, has for centuries been treated by means of general-massage. We may also presume that extensive kneading of the muscles exerts an influence on the formation of uric acid; still, beyond the incomplete facts noted above, on page 64, we know nothing. It is at least certain that we may consider ourselves justified, when contra-indications are not present, in treating gouty patients by means of massage, combined with dietetic treatment, with bodily exercise, which is of equal importance, and the use of alkaline and alkaline-saline mineral waters, etc. In regard to the behavior of local changes in the joints under massage, I would refer to what

has been said concerning Dr. Fogman's method of treatment (see p. 167). Since writing what is there set forth, I have myself had an opportunity to employ massage, with similar results, in the treatment of gout.

Diabetes mellitus.—There has long been an opinion that increased muscular labor contributes to a diminution of the secretion of glucose in diabetes mellitus. That this really happens was shown by Bouchardat, in 1841, by Külz and Von Mering,* in 1874. The latter notes that the secretion of urea is not increased thereby.

It was a more obvious presumption that extensive massage of the muscles is able to produce similar effects; and this has also been proved by Finkler, in Bonn, and Brockhaus, in Godesberg. The experiment was made upon five cases of severe and six cases of slight diabetes, and on three cases of simple glycosuria. The massage consisted of kneading of the muscles of the whole body, at sittings lasting twenty minutes, at first once and later twice a day. The amount of carbo-hydrates ingested was not determined; it was entirely unlimited, however, and the patients were allowed to eat bread and potatoes, to drink beer, and to partake of an abundance of fats and meat. Some of the patients were up and about, and performed vigorous muscular labor; others lay in bed. In all cases a diminution of the sugar secreted occurred; but in this wise that the amount of urine fell off pretty quickly, while its percentage content of sugar remained the same for a long time. In certain cases, the diminution of urine was considerable; though, on the average, a diminution of from 450 to 120 grammes was observed in the twenty-four hours, during the three months' period of observation. In the severest cases, during a hundred days, the average amount diminished from 730 to 200 grammes during twenty-four hours. In one case the sugar disappeared, in spite of the patient's mixed diet, during the treatment, which lasted three months; and did not reappear until three months after the treatment ceased, when the amount was but five grammes in twenty-four hours. Thirst was diminished and perspiration was increased, as was also the body weight. One patient died during the treatment, from pneumonia, another from *coma diabeticum.*

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* See p. 157, of "Verhandlungen des Congresses für innere Medicin," Wiesbaden, 1886. There is in the same work a report on Finkler and Brockhaus's above-mentioned investigations.

In spite of the incomplete determination of the amount of carbo-hydrates ingested; we must consider the experiments as quite conclusive, on account of the tolerably large number of patients, the relatively long time of experiment, and the uniformity of the results obtained.

We may, therefore, with propriety, accord general-massage of the muscles a place in the therapy of diabetes, along with dietetic and other forms of treatment. It is best that the massage should be applied in the morning, before the patient gets up, and in the evening, after he has retired.

It may occur to some of my readers that a Carlsbad physician, who has used massage extensively, by reason of his experience, should be able to report, more fully than others, with regard to the significance of massage in diabetes. Nevertheless, I am bound to say that this is not the case, and that, particularly in Carlsbad, where a relatively large number of diabetic cases come under my observation each year, I have never instituted investigations concerning the influence of massage upon the secretion of sugar. Most of the diabetic cases that come to Carlsbad belong to the class of slight sufferers; and many cases possess, besides, a marked tolerance for carbo-hydrates. On account of the great variability in this tolerance, which marks this disease without any explicable reason, it would be a hazardous undertaking to institute satisfactory investigations in the above direction during the period of a few weeks. Still more prejudicial to the institution of satisfactory experiments on this point are the conditions in Carlsbad, where two factors arise which must be taken into consideration but which cannot be controlled, *i. e.*, the quiet life, free from social activity in that health-resort, and the drinking of the waters, whose influence *per se* upon the secretion of sugar must still be considered undetermined. Although I have repeatedly allowed such patients, who were ready for it, to have general-massage after they had been put to bed; nevertheless, I am not able to give any further account of that form of treatment, except that it was wont to win the patients' encomiums. One of my patients during last summer, a lady something over twenty years of age, who had suffered from diabetes for two years, following the breaking of her marriage engagement (with marked presence of sugar even under a rigid diabetes-diet, with absence of tendon-reflexes, with considerable loss of strength, and a beautiful claret-colored reaction of the urine with chloride of iron) at the advice of another physician, submitted herself, after the spring's treatment was finished, to "after-treatment with general-massage," during which, however, she died from *coma diabeticum*. Still another of my diabetic patients, as was the case with one of Finkler's patients, met with a similar fate. This would not be in the least degree worth speaking of, if it were not necessary continually to remind certain persons of the fact that even massage cannot work miracles.

Rachitis.—In Sweden rachitis has been treated by means of general-massage, now and then. This, particularly, was the case in Stockholm, where atony of the bowel, which is common in that disease, served as a pretext for giving the now popular abdominal-

massage.* In such cases a vigorous massage, above all, effleurage of the extremities, beyond doubt, stands next to abdominal-massage in value. The sittings last about a quarter of an hour; and it is best that they should be given with the child fully stripped of its clothing. Dr. P. Silfverskjöld,† who has specially occupied himself with this treatment of rachitis, and is particularly pleased with his results, states that the longest time requisite for complete and lasting cure is from four to six weeks. Massage may be combined appropriately with passive gymnastic movements, and, obviously, must always be assisted by dietetic and other treatment.

Concerning the behavior of massage in *arthritis deformans*, which disease is still too frequently reckoned among general anomalies of nutrition, I refer the reader to what is said on page 163.

B. Intoxications.

The behavior of massage in cases of poisoning has long constituted an open but hitherto superficially explored field, which assuredly offers many thankworthy opportunities. Of the physiological effects, which may be considered as being particularly pertinent here, the first place must be accorded to the exciting influence of mechanical stimulation of the nerves; and it is exactly this which has been employed for a long time, in conditions approaching collapse or coma, by giving tapotement with the flat hand, by slapping with a towel, by whipping, "flagellation" with a rod, either upon the inner surface of the hand and on the sole of the foot, or over the whole body. Muscle- and nerve-massage, executed after the manner described in different places in this book, is also of importance in the treatment of sensory and motor disturbances of different kinds which occur in cases of chronic intoxication. Massage of the muscles may be of particular value in motor disturbances; and the influence of effleurage, in promoting local circulation, may

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* In this connection, we must not forget that the peritoneum is much more sensitive in children than in adults. Early in the eighties I heard, from a trustworthy source, of two cases in which an unmistakable irritation of the peritoneum was caused by abdominal-massage administered in an extremely incautious manner.

† Behandling af rhachitis med massage och passiva rörelser. Af P. Silfverskjöld. Eira, 1888. "The Treatment of Rachitis by means of Massage and Passive-movements." By P. Silfverskjöld, Eira, 1888.

be availed of in order to prevent gangrene. Finally, the influence of massage upon the heart and upon the entire circulation is a factor which should not be overlooked. In this connection, as has been mentioned above, on page 66, abdominal-massage is specially efficacious, and it must, therefore, in most cases, be resorted to.

From all that has been said, it is evident that in cases of poisoning (wherein a very variable complex of symptoms is present as regards the cerebro-spinal and circulatory systems) the so-called general-massage will be called for most frequently, with many modifications, due to the peculiarities of the case. To arrange and describe these is a problem for the future, when this subject shall have become better understood than it is at present.

The commonest forms of intoxication, in whose treatment massage should be employed, are: (1) acute poisoning from our commonest narcotics and soporifics, viz., opium, morphine, chloroform, chloral, and alcohol, and also chronic morphinism; (2) acute poisoning from carbonic oxide, carbonic acid, and illuminating gas; (3) acute and chronic metallic poisoning, and possibly (4) poisoning from eating mushrooms, and (5) from snake-bite. In acute poisoning from narcotics, as well as in acute cases of alcohol-poisoning, irritation of the nerves by means of flagellation plays an important rôle, if we may judge from the reports of Barrett, Bullar, Levis, and Meyer (see Schreiber's "Massage"). It is obvious that, in addition, we should not forget either general-massage, respiratory-movements, electricity, cold-affusions, or the other usual remedies which may be indicated.

General-massage may form a part of the treatment of chronic intoxications, especially of the too common morphinism. Difference of opinion still exists as to the proper duration of the "tapering-off" period. But whatever system * is adopted, the

* The method of suddenly stopping all morphine is now pretty generally abandoned. It is self-condemned in all cases where the alkaloid has been used for a long time or in considerable doses. Erlenmeyer's method of giving successively smaller doses, for about ten days, and then leaving off entirely, may answer in many slight cases; but often will be out of the question, on account of the threatened collapse of the patient. In the majority of cases we must be prepared to continue the treatment for several weeks or months. The treatment will demand great sacrifices from the physician, the nurses, and above all, the patient. The prognosis will be nearly hopeless if one cannot control the patient completely during the whole time of treatment. Such control is rarely to be had outside of an asylum.

patient, after he has ceased to take morphine, will fall into such a state of weakness as to make the practitioner anxious to use any remedy that will increase the strength of the heart and muscles, and improve the patient's general condition. The patient will often remain in bed during a part of the treatment, which fact constitutes another indication for the use of general-massage as a substitute for locomotion. I saw good effects from the employment of general-massage twice a day in a difficult case of the morphin-alcohol-cocain habit that was under my care for a considerable length of time.

In the not infrequent cases of poisoning by carbonic-oxide, carbonic-acid, or illuminating gas, a more or less rationally managed massage, with rubbing and flagellation during the comatose stage, has been in use for a long time.

I have already mentioned the value of massage in metallic-poisoning, as a means of counteracting the motor disturbances due to chronic poisoning, from mercury and lead. In the cerebro-spinal form of acute arsenical poisoning general massage should be attempted.

In poisoning by fungi, massage may be an appropriate adjuvant to the usual treatment during the narcotic stage. In acute or chronic ergotism, we may also imagine that vigorous effleurage would be efficacious in reviving the circulation, and, while it would be advantageous as regards the other symptoms, that it might thereby prevent gangrene or limit it. This is a matter concerning which, so far as I know, no reports exist.

The same procedure might well be employed after snake-bite where the usual symptoms of collapse might be affected in the manner indicated. Nevertheless we have no reports of such treatment either from Europe, where it is only seldom that we have to do with the result of a viper's bite, or from other parts of the world where the horrible members of the *crotalus*, *trigonocephalus*, *maja* and other families frequently cause death. The local symptoms with marked œdematous-infiltration (which is sometimes followed by gangrene), may also offer an indication for treatment with effleurage, whose property of quickly diffusing the poison and so preparing the way for a thorough local treatment of the wound by means of ligature, incision, cauterization, etc., may be taken into account.

In this, as in other cases, I take it massage should never be used alone. It must surely rank lower in value than other remedies, especially alcohol, concerning which opinions are so far divided, in that some physicians look upon it only as a remedy for prostration and the threatened paralysis of the heart, and give it in small doses only, while others look upon it as a specific antidote and employ it in enormous quantities.

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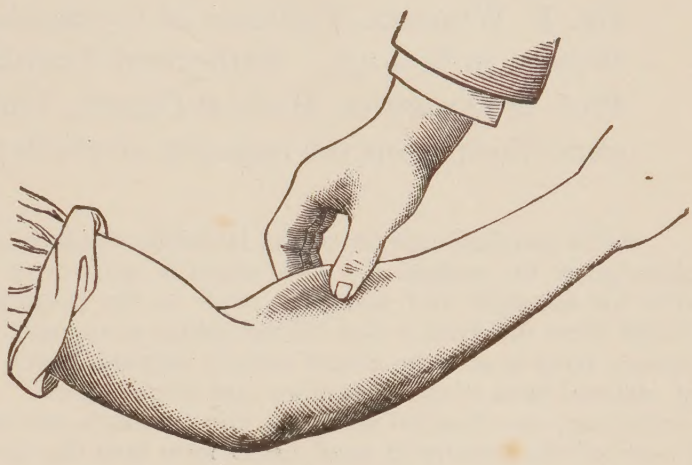

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